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January 21, 2011

Mary Freeman, Chairman
Tennessee Regulatory Authority
c/o Sharla Dillon, Docket Clerk
460 James Robertson Parkway
Nashville, TN 37243

filed electronically in docket office on 01/21/11

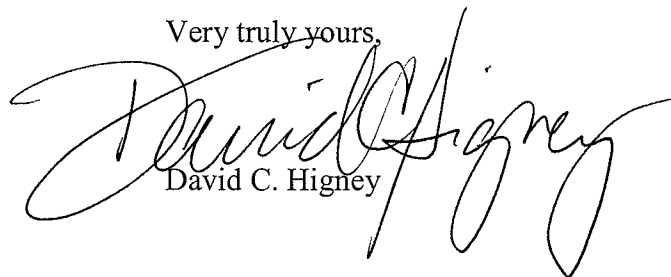
Re: In re Petition of Tennessee American Water Company for a General Rate Increase
TRA Docket No. 10-00189

Dear Chairman Freeman:

Enclosed are the original and five (5) copies of Chattanooga Regional Manufacturers Association's Responses and Objections to Tennessee American Water Company's Second Set of Data Requests.

If you have any questions, please do not hesitate to contact me.

Very truly yours,



David C. Higney

Enclosure

cc: Counsel for All Parties
Henry M. Walker, Esq. (via email)
Timothy L. Spires (via email)

**BEFORE THE TENNESSEE REGULATORY AUTHORITY
NASHVILLE, TENNESSEE**

IN RE:	*	
	*	
PETITION OF TENNESSEE-	*	DOCKET NO. 10-00189
AMERICAN WATER COMPANY TO	*	
CHANGE AND INCREASE CERTAIN	*	
RATES AND CHARGES	*	

**CHATTANOOGA REGIONAL MANUFACTURERS ASSOCIATION'S
RESPONSES AND OBJECTIONS TO
TENNESSEE AMERICAN WATER COMPANY'S
SECOND SET OF DATA REQUESTS**

The Chattanooga Regional Manufacturers Association ("CRMA"), by and through its attorneys, submits the following responses and objections to the Tennessee American Water Company's ("TAWC" or the "Company") First Set of Data Requests propounded upon CRMA. CRMA has set forth in Part I its objections generally applicable to the Company's data requests, and its responses and specific additional objections to the Company's data requests in Part II.

PART I - GENERAL OBJECTIONS

1. CRMA objects to the definitions and instructions contained in the data requests to the extent that the definitions and instructions attempt to impose on CRMA a burden or obligation greater than that required by the *Tennessee Rules of Civil Procedure* and applicable statutes and regulations governing contested case hearings.

2. CRMA objects to the data requests to the extent they call for information and the production of documents which are protected from disclosure by the attorney-client privilege, the attorney work product doctrine or any other applicable privilege or protection. CRMA objects to the Company's data requests to the extent that the Company is attempting to impose on CRMA obligations with regard to identification of privileged documents beyond those required by the

Tennessee Rules of Civil Procedure and applicable statutes and regulations governing contested case hearings.

3. CRMA objects to the Company's discovery requests to the extent that they seek information to matters not at issue in this litigation or to the extent they are not reasonably calculated to lead to the data of admissible evidence. By providing information in response to these requests, CRMA does not concede that such information is relevant, material or admissible in evidence. CRMA reserves all rights to object to the use of such information as evidence.

4. CRMA objects to the Company's discovery requests to the extent that the Company is attempting to impose on CRMA obligations to supplement its responses beyond those required by the *Tennessee Rules of Civil Procedure* and applicable statutes and regulations governing contested case hearings.

5. CRMA objects to the Company's discovery requests to the extent that the Company is attempting to require CRMA to provide information and produce documents beyond those in its possession, custody or control as that phrase is used in the *Tennessee Rules of Civil Procedure* and applicable statutes and regulations governing contested case hearings.

6. CRMA objects to the Company's discovery requests to the extent that they seek information and documents that are readily available through a public source or are in the Company's own possession, custody or control. It is unduly burdensome and oppressive to require CRMA to respond or produce documents that are equally or more available to the Company.

7. CRMA objects to the production of any documents prepared by it subsequent to the filing of this litigation or contested case.

8. CRMA's objections and responses to these requests are based on information now known to it. CRMA reserves the right to amend, modify or supplement its objections and responses if it learns of new information.

CRMA also supports, adopts, and incorporates herein by reference relevant and appropriate objections made by the Consumer Advocate & Protection Division and the City of Chattanooga, or any other intervenor, since the Company has propounded similar data requests to other intervenors.

PART II - RESPONSES AND ADDITIONAL OBJECTIONS TO SPECIFIC DATA REQUESTS

Subject to and without waiving any of the objections stated above, CRMA responds to each of the specific discovery requests as follows:

REQUEST NO. 1:

Please provide any studies, documents, CRMA Minutes, or correspondence from 2008 to present possessed by the CRMA or the TAWC customers represented by the CRMA that address the impact of the cost of water on their business.

CRMA – 1 RESPONSE:

The burden of proof in this matter is on the public utility, TAWC, to demonstrate (if it can) that the rate increases the Company has requested are just and reasonable. CRMA is not a public utility, nor a regulated monopoly, almost annually seeking millions of dollars in increased rates to be paid by customers. Considering that burden of proof, CRMA objects to the request on the grounds that it is unduly burdensome, overbroad, ambiguous, vague, retaliatory, oppressive and appears to be designed to deter CRMA, and/or its member companies and their employees, from participating in this and future rate cases.

CRMA further objects to this request on the basis that it could be construed to seek materials, if any, subject to the Attorney-Client Privilege, Attorney Work Product doctrine, other

applicable privileges which are not waived, and/or that have been made or undertaken in anticipation of (or during) litigation. CRMA further objects to the request on the basis that CRMA minutes also are proprietary. CRMA further objects to Request No. 1 as vague and ambiguous relative to the phrase “address the impact of the cost of water” and, additionally, on the grounds that it may be construed as seeking confidential and proprietary business information of CRMA’s members. CRMA further objects to the request to the extent it calls for materials or data already in the possession, custody or control of TAWC or its affiliates, since such data (if any) is at least as readily available to TAWC as to CRMA. For example, TAWC already possesses the invoicing for all TAWC customers to the extent such invoices address the impact of the cost of water on CRMA member businesses.

Subject to and without waiving all prior objections, and in an attempt to avoid being delayed or distracted further by anticipated motions to compel or other dilatory tactics by TAWC that will escalate rate case expenses and interfere further in CRMA’s, TRA and its Staff’s, and other Intervenor’s preparation for the hearing in this matter whether the proposed rates are just and reasonable, CRMA refers the Company to pre-filed direct testimony, exhibits, schedules, work papers, other materials previously filed with the TRA relative to TAWC’s rate cases and responsive documents attached hereto as CRMA (2nd) Attachment 1.

REQUEST NO. 2:

Please provide any studies, documents, CRMA Minutes, or correspondence from 2008 to present possessed by the CRMA or by the TAWC customers represented by the CRMA that address the level of service or reliability of service provided by TAWC.

CRMA – 2 RESPONSE:

CRMA objects to Discovery Request No. 2 as being vague and ambiguous relative to the phrase “TAWC customers represented by the CRMA that address the level of service or reliability of service provided by TAWC.” CRMA also objects to this request to the extent it calls for responsive information materials or data already in the possession, custody or control of TAWC or its affiliates, since such data (if any) is at least as readily available to TAWC as to CRMA.

Subject to and without waiving all prior objections, please see CRMA-1 Response, above, which is incorporated herein by reference as if fully restated. See also CRMA Responses and Objections to TAWC Discovery Request No. 3 in TRA Docket No. 08-00039.

REQUEST NO. 3:

Please provide any agreements or correspondence from 2008 to present between the CRMA and TAWC customers represented by the CRMA addressing the CRMA's participation in TAWC rate proceedings.

CRMA – 3 RESPONSE:

CRMA objects to Discovery Request No. 3 as being vague and ambiguous, or overbroad, relative to the phrase “addressing the CRMA’s participation in TAWC rate proceedings.” CRMA also objects on the grounds that the request is spurious and irrelevant to this proceeding. It is TAWC’s burden to prove as a public utility regulated by the Authority that the multi-million dollar rate increases it seeks repeatedly are “just and reasonable” – a burden the Company has failed to satisfy in recent cases. Attempts by the Company through discovery to thwart communications and chill discussion and dialogue between CRMA member ratepayers, CRMA officers and CRMA’s Board, cannot and should not be condoned knowing that for their business livelihood CRMA members rely upon appropriate levels of service at a fair price without interruption or intimidation or retribution from TAWC or its management.

This Company request is an example of the waste of TRA Staff and ratepayer resources. - Subject to and without waiving all prior objections please see CRMA-1 Response, above, incorporated herein by reference as if fully restated and responsive documents attached hereto as CRMA (2nd) Attachment 1.

REQUEST CRMA - NO. 4:

Please provide the Return on Equity and Profit Margin for each customer represented by the CRMA. If any of those customers represented by the CRMA are segments of a larger business, please provide the ROE (if applicable) and the Profit Margin for the Chattanooga-based operation.

CRMA – 4 RESPONSE:

In the last two rate cases, TRA Docket Nos. 08-00039 and 06-00290, the Company also sought such information for CRMA members. CRMA objected to those requests, and objects as well as to this request since it is overbroad, unduly burdensome irrelevant and not designed to lead to the discovery of admissible evidence.

As in the 2008 case, in the instant matter (TRA Docket No. 10-00189) there are no CRMA member companies that have provided pre-filed direct testimony in this rate case.¹ Thus, the requested information simply is not relevant. Indeed, the Return on Equity and Profit Margin for private businesses and CRMA member companies is vastly different than the requested allowable Return on Equity sought by TAWC – a public utility that is supposed to be providing in theory a public service to the ratepayers and taxpayers, many who have no alternative but to receive water treated by TAWC after it is obtained from a public source (the Tennessee River).

CRMA objects to TAWC's request to the extent it seeks to require CRMA to create materials from raw data, regardless of whether CMA possesses such data. Clearly this request is an oppressive and unwarranted intrusion into the business practices of some of the Company's largest customers, perhaps designed to intimidate such customers with the threat of having to

¹ Pursuant to confidentiality provisions of a protective order, certain information from two CRMA member company's was submitted where those CRMA entities had submitted an officer's pre-filed direct testimony in TRA Docket 06-00290 as to precise adverse impacts that would be suffered at their entities if the increase were approved in that matter. Indeed, as a CRMA witness predicted would happen should water rates continue to increase, one of the highest usage entities has now closed its business in Chattanooga.

reveal sensitive business information for questioning an unreasonable and unprecedented request by a public utility that seeks to increase rates.

CRMA avers that, considering the rate case expense amounts recently sought by TAWC in its requests for rate increases, it is difficult to conceive how a request could be more offensive. It is precisely this kind of discovery request that could be specifically cited in a TRA order to support the Authority's finding that not all rate case expenses claimed by a utility should be recoverable as a matter of course. In fact, a public utility's shareholders should be held accountable for failing to scrutinize the types of discovery tactics it authorizes; especially to the extent restraint is not demonstrated in discovery by focusing on key ratemaking principles concerning the Company's rates being just and reasonable through the Authority's judgment and application of the proper ROE for a public utility.

Moreover, CRMA objects on the grounds that the request is irrelevant, and neither a reasonable nor prudent expenditure of Company money to be charged to ratepayers because ratepayers get no benefit from a request such as this. Such an explicit finding could be made by the TRA in order to rebut arguments that the Authority has erred in any conclusion that shareholders should bear some of the burden of escalating rate case expenses.

REQUEST NO. 5:

Please provide all the engagement letters, contracts, correspondence and fee schedules paid by the CRMA to Michael Gorman or Brubaker Associates, Inc. during the last five years.

CRMA – 5 RESPONSE:

CRMA objects to the request as irrelevant, overly broad and unduly burdensome. Subject to and without waiving all prior objections, CRMA provides the following response.

Please refer to CRMA – 1 Response to Request No. 1, above, and CRMA – 4 Response to TAWC’s First Set of Discovery Requests, No. 4. Notwithstanding all objections, any business prior to this case between Michael Gorman, Brubaker & Associates, Inc. and CRMA conducted during the last five years did not result in the development of positions taken in this case or discoverable materials for this proceeding, other than those previously submitted.

For purposes of this case BAI has an oral agreement with CRMA concerning BAI activities relative to this proceeding wherein BAI will bill for its services based on hourly billing rates, time spent, and out-of-pocket expenses at previously disclosed rates for BAI review and investigation of TAWC filings; assistance in the conduct of discovery, as needed; responding to data requests, if necessary; assistance with negotiations and evaluation of compromise positions and settlement proposals, if any; prepare analysis, workpapers, direct testimony with schedules/exhibits; and consult or participate in rate hearings (if any); to the extent such services could be provided within a budget not to exceed \$40,000 plus expenses. Hourly billing rates of BAI employees Michael Gorman and Greg Meyer are \$215 and \$145, respectively, and additional hourly billing rates of BAI’s Analyst Department are approximately \$130 or less. CRMA will provide responsive non-privileged documents or correspondence, if any exist, relating to Mr. Gorman’s employment in this case.

REQUEST NO. 6:

For each CRMA member testifying in this docket on behalf of the CRMA or making public comments in this docket for any purpose, please provide a schedule listing the total annual amount their Chattanooga operations spent from 2008 to present on each of the following: water, electricity, natural gas, sewer, and local property tax; and individually for each of the foregoing costs, calculate what percent of total operating costs and budgeted costs each of the foregoing costs represents for their Chattanooga operations.

CRMA – 6 RESPONSE:

CRMA objects to this request on the grounds that it is overly broad and unduly burdensome, vague, ambiguous, and designed to harass or increase the expense to CRMA. CRMA further objects to the request to the extent it calls for materials or data already in the possession, custody or control of TAWC or its affiliates, since such data (if any) is at least as readily available to TAWC as to CRMA. For example, TAWC already possesses the invoicing for all TAWC customers to the extent such invoices may be construed to address the impact of the cost of water on CRMA member businesses. Subject to and without waiving all previously stated objections, CRMA refers TAWC to see CRMA's responses to TAWC Discovery Request Nos. 1, 2, 3, and 4, above.

REQUEST NO. 7:

Identify and/or produce all communications between the CRMA and its members, or between CRMA members, regarding, relating or referring to this rate case.

CRMA – 7 RESPONSE:

CRMA objects to this request on the grounds that it is overbroad, vague, ambiguous, and unduly burdensome. CRMA further objects to the request to the extent it calls for materials or data already in the possession, custody or control of TAWC or its affiliates, since such data (if any) is at least as readily available to TAWC as to CRMA. For example, TAWC already possesses the invoicing for all TAWC customers to the extent such invoices have been reviewed or may be construed to address the impact of the cost of water on CRMA member businesses. Subject to and without waiving all previously stated objections, CRMA refers the Company to see CRMA's responses to Discovery Request Nos. 1 and 4, above, and attached responsive materials.

REQUEST NO. 8:

Please provide all underlying data and computations, in native format, supporting Exhibit MPG-3 of Mr. Gorman's direct testimony.

CRMA – 8 RESPONSE:

CRMA objects on the grounds that the request seeks duplicative data, and is overly broad, vague, and ambiguous. Subject to and without waiving all previously stated objections, CRMA refers the Company to Mr. Gorman's direct testimony and workpapers filed and served on or about January 5 and January 7, 2011, as the requested information already was supplied to TAWC in this matter.

If, for some reason, the materials are believed by the Company not to have been transmitted or otherwise filed and served, CRMA agrees to work in good faith with TAWC to identify and to resolve any legitimate concerns of the Company relative to this request concerning MPG-3.

REQUEST NO. 9:

With respect to Mr. Gorman's work papers and Exhibit MPG-1, please produce all detailed underlying calculations that support this exhibit. With respect to the electric power costs contained on Exhibit MPG-4, please explain how many EPB tariffs were considered for the booster station portion of the water loss adjustment and how this portion of the adjustment would change if actual demand and kWh charges were applied.

CRMA – 9 RESPONSE:

CRMA objects on the grounds that the request is overbroad, vague and ambiguous. Subject to and without waiving all previously stated objections, CRMA further responds and refers the Company to Mr. Gorman's workpapers and testimony that were filed and served on or about January 5 and January 7, 2011.

Mr. Gorman's Exhibit MPG-4 did not consider EPB tariffs. It is the "Summary of Working Capital."

With respect to electric power costs, CRMA reincorporates Mr. Gorman's testimony and workpapers relative to Exhibit MPG-1. Mr. Gorman reviewed the TAWC electricity charges found in Ms. Sheila Miller's workpapers (TAWC Response to TRA Data Request No. 1, Question 13) and his calculations were not directly based on consideration of EPB tariffs.

REQUEST NO. 10:

With respect to MPG Exhibits 1-3, please provide a detailed explanation for how Mr. Gorman calculated all numerical values contained on the worksheets “WP CITICO Pwr (Lost Wtr Adj)” and “WP Booster Pwr (Lost Wtr Adj).” Include all underlying calculations and source data supporting the numerical values contained on these exhibits.

CRMA – 10 RESPONSE:

CRMA objects to this request on the grounds that the request is overbroad, vague, ambiguous and unduly burdensome. Subject to and without waiving all previously stated objections, CRMA refers the Company to Mr. Gorman’s workpapers and testimony that were filed and served on or about January 5 and January 7, 2011 and to CRMA-1 Response to TAWC’s First Set of Discovery Requests To CRMA.

CRMA further responds that the data and calculations found in “CITICO Station Power Charges Per Company” and “Booster Station Power Charges Per Company” both refer to data and/or calculations made in Sheila Miller’s workpapers for Fuel and Power, provided in TAWC’s response to TRA Data Request No. 1, Question 13.

The total system delivery, shown on line 26 of the “Power Cost for CITICO Station – Lost Water Adjustment” tab divides the sales for attrition year, found on page 3 of Ms. Miller’s Fuel and Power workpapers, by 85%. The resulting total is then spread to the months in proportion to the monthly amounts of the adjusted system delivery found on page 1 of Ms. Miller’s Fuel and Power workpapers.

The total energy component was calculated using the same ratio of sales to kilowatt-hours as found on page 1 of Ms. Miller’s Fuel and Power workpapers. Demand was calculated as a ratio of kilowatts to system delivery and multiplied by the revised system delivery. The customer charges were not changed. Rates for all of the CITICO Station billing determinants were found on page 1 of Ms. Miller’s Fuel and Power workpapers.

For the Booster Station, monthly system delivery, found on page 2 of Ms. Miller's Fuel and Power workpapers, was multiplied by the attrition year adjustment factor. This was then compared with the attrition year adjusted kilowatt-hours in order to develop the kilowatt-hours per thousand gallons factor. Rates for each billing determinant were also found on page 2 of Ms. Miller's Fuel and Power workpapers.

In order to calculate the revised total system delivery – assuming only 15% lost or unaccounted for water – Mr. Gorman took the attrition year sales, found on line 13 of his workpaper, and multiplied that by the Company's ratio of sales to system delivery (both numbers can be found on page 3 of Ms. Miller's Fuel and Power workpapers). Mr. Gorman then divided the resulting product by 85%.

Using the previously calculated kilowatt-hours to thousand gallons ratio, Mr. Gorman calculated the total energy requirement for the Booster Station. Mr. Gorman used the ratio of attrition year kilowatts to system delivery to develop the revised total demand. Rates for all Booster Station billing determinants were found in Ms. Miller's Fuel and Power workpapers, on page 2.

Please Note: Column 5 of the "Booster Station Power Charges Using Only 15% Allowable Lost Water" portion of this workpaper was inadvertently mislabeled as "Customer Charge." It should have been labeled as "Energy Rate."

REQUEST NO. 11:

With respect to the work paper “WP Chem (Lst Wtr Adjtmnt),” provide a detailed explanation of how Mr. Gorman calculated all “Cost/CCF” values.

CRMA – 11 RESPONSE:

CRMA responds, as it understands this request, that the “Cost/CCF” values were found in Sheila Miller’s “Chemicals” workpapers. Please refer to footnote 1 of the “WP Chem (Lst Wtr Adjtmnt)” workpaper. For the convenience of the Company, it is reproduced below:

¹Company response to TRA Data Request No. 1, Question 13, Sheila Miller’s “Chemicals” workpaper, page 2 of 6.

REQUEST NO. 12:

Provide copies of all reports, studies, testimony, exhibits, work papers and presentations prepared by Mr. Gorman and filed in any other water utility rate cases, regarding water loss adjustments, power costs or water treatment chemical costs.

CRMA – 12 RESPONSE:

CRMA objects to this request as unduly burdensome, overly broad, and irrelevant to this proceeding. CRMA avers, upon information and belief, that other American Water operating affiliates have not issued similar data requests to Mr. Gorman relative to his qualification to present expert testimony. Subject to and without waiving all of the above, CRMA provides the following response.

As indicated by Mr. Gorman's list of cases in which he has testified as an expert witness across the country, which was sent to the Company months ago (CRMA-4 Response to TAWC's First Set of Discovery Requests, request number 4, served November 15, 2010), it is evident that a request for all reports, studies, testimony, exhibits, workpapers, and presentations by CRMA's expert, Mr. Gorman, concerning water loss adjustments, power costs, or water treatment chemical costs is clearly designed to harass or unduly burden an intervenor.

TAWC, or its affiliates, has in its possession or available to it copies of testimony, exhibits, and workpapers prepared in numerous prior rate cases before the TRA and other similar agencies in which Mr. Gorman or a BAI consultant under Mr. Gorman's supervision has testified as an expert regarding water loss adjustments, fuel and power costs, or water treatment chemical costs. CRMA avers, upon information and belief, such materials are equally or more accessible to TAWC, or its affiliate(s), as they would be to CRMA and are available on electronic public dockets for which CRMA has provided the docket number (where available) in its response.

In addition to TAWC's last rate case, Mr. Gorman and other BAI consultants reviewed cost of service issues (revenue, expenses, rate base and rate of return) and class cost of service studies in many rate proceedings around the country. The following is a list of water cases in which Mr. Gorman, or a BAI consultant under Mr. Gorman's supervision, has addressed these issues over the last 18 months:

1. Indiana-American Water Company, Indiana Utility Regulatory Commission Cause No. 43680
2. Missouri-American Water Company, Missouri Public Service Commission Case No. WR-2010-0131
3. Illinois-American Water Company, Illinois Commerce Commission Docket No. 09-0319
4. Indianapolis Water Company, Indiana Utility Regulatory Commission Cause No. 43645
5. Kansas City, Kansas Board of Public Utilities water rate filing 2010 (no docket number)
6. Milwaukee Water Works rate filing 2010, Public Service Commission of Wisconsin Docket No. 3720-WR-107
7. Artesian Water Company, Delaware Public Service Commission Docket No. 08-96

REQUEST NO. 13:

Provide all reports, studies, calculations and any other documents that were relied upon by, and referenced in the direct testimony of Mr. Gorman, including but not limited to the 2002 Janice A. Beecher survey.

CRMA – 13 RESPONSE:

CRMA objects to this request as overbroad and unduly burdensome. Subject to and without waiving previously stated objections, CRMA provides the following response. CRMA reincorporates Mr. Gorman's testimony as if fully restated herein, and refers TAWC to the attached copy of the 2002 Janice A. Beecher survey referenced in the Direct Testimony of Michael Gorman in this docket. See CRMA (2nd) Attachment 13. Moreover, CRMA will work in good faith with TAWC to resolve any legitimate concern of the Company relative to any specifically referenced document not already in TAWC's possession or not otherwise publicly available.

REQUEST NO. 14:

Please state all facts that support Mr. Gorman's qualifications to testify as an expert witness with respect to Lost or Unaccounted for Water.

CRMA – 14 RESPONSE:

CRMA reincorporates and refers TAWC to Mr. Gorman's testimony, workpapers, and exhibits including, but not limited to, Mr. Gorman's CV. CRMA also incorporates and refers TAWC to CRMA's response to Request No. 12, Mr. Gorman's expert testimony as recognized before this Authority numerous times and Mr. Gorman's list of cases in which he has testified as an expert witness across the country that was sent to the Company months ago (CRMA-4 Response to TAWC's First Set of Discovery Requests, request number 4, served November 15, 2010). CRMA avers, upon information and belief, that other American Water operating affiliates have not issued similar data requests to Mr. Gorman relative to his qualification to present expert testimony.

REQUEST NO. 15:

Please state all facts that support Mr. Gorman's qualifications to testify as an expert witness with respect to Normal Sales Revenue.

CRMA – 15 RESPONSE:

CRMA reincorporates and refers TAWC to Mr. Gorman's testimony, workpapers, and exhibits including, but not limited to, Mr. Gorman's CV. CRMA also incorporates and refers TAWC to CRMA's response to Request No. 12, Mr. Gorman's expert testimony as recognized before this Authority numerous times and Mr. Gorman's list of cases in which he has testified as an expert witness across the country that was sent to the Company months ago (CRMA-4 Response to TAWC's First Set of Discovery Requests, request number 4, served November 15, 2010). CRMA avers, upon information and belief, that other American Water operating affiliates have not issued similar data requests to Mr. Gorman relative to his qualification to present expert testimony.

REQUEST NO. 16:

Please state all facts that support Mr. Gorman's qualifications to testify as an expert witness with respect to Working Capital Adjustment.

CRMA – 16 RESPONSE:

CRMA reincorporates and refers TAWC to Mr. Gorman's testimony, workpapers, and exhibits including, but not limited to, Mr. Gorman's CV. CRMA also refers TAWC to CRMA's response to Request No. 12, Mr. Gorman's expert testimony as recognized before this Authority numerous times and Mr. Gorman's list of cases in which he has testified as an expert witness across the country that was sent to the Company months ago (CRMA-4 Response to TAWC's First Set of Discovery Requests, request number 4, served November 15, 2010). CRMA avers, upon information and belief, that other American Water operating affiliates have not issued similar data requests to Mr. Gorman relative to his qualification to present expert testimony.

REQUEST NO. 17:

Please state all facts that support Mr. Gorman's qualifications to testify as an expert witness with respect to the Other Revenue Requirement Issues (including but not limited to rate of return and service company fees) addressed on pages 21-24 of Mr. Gorman's pre-filed testimony.

CRMA – 17 RESPONSE:

CRMA reincorporates and refers TAWC to Mr. Gorman's testimony, workpapers, and exhibits including, but not limited to, Mr. Gorman's CV. CRMA also incorporates and refers TAWC to CRMA's response to Request No. 12, Mr. Gorman's expert testimony as recognized before this Authority numerous times and Mr. Gorman's list of cases in which he has testified as an expert witness across the country that was sent to the Company months ago (CRMA-4 Response to TAWC's First Set of Discovery Requests, request number 4, served November 15, 2010). CRMA avers, upon information and belief, that other American Water operating affiliates have not issued similar data requests to Mr. Gorman relative to his qualification to present expert testimony.

REQUEST NO. 18:

Please provide a copy of CRMA's current organizational documents, including but not limited to the organization's charter and bylaws.

CRMA – 18 RESPONSE:

CRMA further objects on the grounds that this request is vague, ambiguous, unlimited in scope or time, and irrelevant to this proceeding. CRMA further objects on the grounds that such a request is interposed for harassment, delay, and unjust expense, and to drive up both this intervenor's expense and expenses the Company will seek to recover from ratepayers despite no associated benefit to the ratepayers.

CRMA also objects to the extent that certain documents are publicly available and as easily accessible to TAWC as to CRMA. Subject to and without waiving all previously stated objections, please refer to CRMA response Nos. 1 and 4, above, and to the organization's charter and bylaws attached to these data requests as CRMA (2nd) Attachment 18.

REQUEST NO. 19:

Please state all facts that support Mr. Gorman's qualifications to testify as an expert witness with respect to cost of service.

CRMA – 19 RESPONSE:

CRMA reincorporates and refers TAWC to Mr. Gorman's testimony, workpapers, and exhibits including, but not limited to, Mr. Gorman's CV. CRMA also incorporates and refers TAWC to CRMA's response to Request No. 12, Mr. Gorman's expert testimony as recognized before this Authority numerous times and Mr. Gorman's list of cases in which he has testified as an expert witness across the country that was sent to the Company months ago (CRMA-4 Response to TAWC's First Set of Discovery Requests, request number 4, served November 15, 2010). CRMA avers, upon information and belief, that other American Water operating affiliates have not issued similar data requests to Mr. Gorman relative to his qualification to present expert testimony.

REQUEST NO. 20:

Please state all facts that support Mr. Gorman's qualifications to testify as an expert witness with respect to rate design.

CRMA – 20 RESPONSE:

CRMA reincorporates and refers TAWC to Mr. Gorman's testimony, workpapers, and exhibits including, but not limited to, Mr. Gorman's CV. CRMA also incorporates and refers TAWC to CRMA's response to Request No. 12, Mr. Gorman's expert testimony as recognized before this Authority numerous times and Mr. Gorman's list of cases in which he has testified as an expert witness across the country that was sent to the Company months ago (CRMA-4 Response to TAWC's First Set of Discovery Requests, request number 4, served November 15, 2010). CRMA avers, upon information and belief, that other American Water operating affiliates have not issued similar data requests to Mr. Gorman relative to his qualification to present expert testimony.

GRANT, KONVALINKA & HARRISON, P.C.

By: 

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- and -

**BRADLEY, ARANT, BOULT, CUMMINGS,
LLC**

By: _____

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*Attorneys for the
Chattanooga Regional Manufacturers Association*

CERTIFICATE OF SERVICE

I hereby certify that on this 21st day of January, 2011, a true and correct copy of the foregoing document was served either by fax, overnight delivery service or first class mail-postage prepaid, to all parties of record at their addresses shown below:

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GRANT, KONVALINKA & HARRISON, P.C.

CRMA (2nd) – ATTACHMENT 1

Tim Spires

From: Tim Spires [tspires@cma1902.com]
Sent: Thursday, September 30, 2010 4:42 PM
To: 'tspires@cma1902.com'
Subject: TAWC Rate Increase
CMA Board,

This email is to inform you that CMA has intentions to file a petition for intervention with the TRA on the recently filed petition of Tennessee American Water Company to "Change and Increase Certain Rates and Charges, Docket No. 10-00189." The fact that TAWC is requesting a 28% increase during the current economic conditions, is asking for an average return on equity of 11.5%, and the continued frequency of rate increase requests are incomprehensible. If their increases were granted, this would result in increased unfavorable business conditions for our members.

The hearing for this docket is scheduled for October 11, 2010. As a result of the shortened time frame, it is necessary for CMA to file our petition on Monday, October 4th. The Consumer Advocate Division has already filed for intervention and the City of Chattanooga is strongly considering it also.

After we have filed for intervention, we will have some time to raise funds to proceed with the intervention. We can determine our degree of intervention or even withdraw at a later date if we cannot fund the necessary costs. If we do not file at this time, we will miss our opportunity forever.

If anyone has any objection to our proceeding with this petition for intervention, please respond to me by email ASAP, as I will be out of the office on Friday, October 1, 2010. If I do not hear anything from you, I will take that as a vote of support for moving forward with the intervention petition filing.

This intervention is critical in determining how future rate requests of the TAWC will be handled. Based upon the recent ruling of the TRA on the natural gas rate increase, we hope to have favorable results with the TAWC also.

Thank you for your support of our regional manufacturers.

Tim L. Spires
President and CEO

Chattanooga Manufacturers Association
tspires@cma1902.com
www.cma1902.com

Office:	Mail:
10 West MLK Blvd., 5th Floor	PO Box 11489
Chattanooga, TN 37402	Chattanooga, TN 37401

Phone: 423-266-1902
Fax: 423-266-1985

Tim Spires

From: Tim Spires [tspires@cma1902.com]
Sent: Wednesday, November 10, 2010 3:44 PM
To: 'Tim Spires'
Subject: Intervention Email

Dear CRMA Member,

As you are aware, on September 17, 2010, the Tennessee American Water Company (TAWC) filed a petition with the Tennessee Regulatory Authority (TRA) requesting another increase in revenue. This request of \$9.984 million, relating to nearly a 28% increase, is the highest on record. The CRMA believes this increase request to be unfair and unreasonable and filed a petition and has been granted permission to intervene upon your behalf.

Attached you will find a letter explaining the impact of this rate increase on your business operations and a request for your help in this intervention. Our success in this matter is dependent upon the funding support we receive from our members. If we do not receive enough funds to properly support the legal and analysis costs to fight this rate increase, we will need to withdraw our petition for intervention. If this should occur, we will be at the mercy of the other interveners and the TRA. Please carefully read the attached document and strongly consider lending your financial support in this very important intervention effort.

Please do not hesitate to call me if you have any questions beyond what is presented.

Kind regards,

Tim L. Spires
President and CEO

Chattanooga Regional Manufacturers Association
tspires@cma1902.com
www.cma1902.com

Office:
10 West MLK Blvd., 5th Floor
Chattanooga, TN 37402

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Chattanooga Regional Manufacturers Association

November 5, 2010

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Derryberry Public Relations

Dear CRMA Member,

As you are aware, on September 17, 2010, the Tennessee American Water Company (TAWC) filed a petition with the Tennessee Regulatory Authority (TRA) requesting another increase in revenue. This request of \$9.984 million, relating to nearly a 28% increase, is the highest on record. The Chattanooga Regional Manufacturers Association (CRMA) had requested previously, on several occasions, that TAWC set down with our members and discuss the substance of any rate increase prior to any filing. This discussion would support an effort to come to an understanding and could reduce or alleviate costly legal costs. In this case, TAWC would not share any details of the reasoning of their request until after it had been filed with the TRA. The CMA believes this increase request to be unfair and unreasonable and filed a petition and has been granted permission to intervene upon your behalf.

These rate increase filings by TAWC are becoming more frequent, and their requests are increasing in dollar amount. While increases have become to be expected over time, increases of this magnitude and frequency are unprecedented. We strongly deem that the efforts by the CRMA in previous interventions have reduced significant financial burdens on our members and others in the community.

The following chart shows the success that CRMA and others have had over the past seven years in these interventions. This chart compares the rate requested by TAWC to the rate granted by the TRA and shows the impact of a base cost of \$100 for water billing prior to first rate increase request shown in 2003. For the year 2010, the impact is shown as if the TRA were to grant the request in its entirety. This following chart also shows the growth in the Consumer Price Index as compared to the increases.

Filing Year	TAWC Request	Cost Compounded	TRA Granted	Cost Compounded	CPI*
2003	12.00%	\$112.00	6.00%	\$106.00	\$102.28
2004	5.96%	\$118.68	0.91%	\$106.96	\$105.00
2006	19.67%	\$142.02	12.34%	\$120.16	\$112.06
2008	21.70%	\$172.84	4.37%	\$125.42	\$119.86
2010	27.66%	\$220.64	27.66%	\$160.11	\$121.42

*Bureau of Labor Statistics-CPI Inflation Calculator

Location: 10 West MLK Blvd. · Chattanooga, TN 37402 · Phone 423-266-1902 · Fax 423-266-1985
Mailing Address: P.O. Box 11489 · Chattanooga, Tennessee 37401

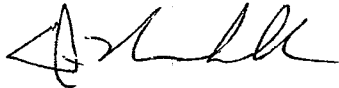
CRMA has a lengthy and successful history of legal intervention in utility rate cases. While the TAWC has sufficient means to spend a large amount of money (transferred back to rate payers) on legal expenses to convince the TRA that their request is appropriate, the CRMA does not have funds available for these expenses.

In the past, the majority of financial support for these interventions has been provided by a relatively small number of CRMA companies, primarily the large-volume users of utility services. The current situation finds a convergence of fewer large-volume users, more complex and more frequent filings for rate increases, and larger increases requested by utility providers who are not locally owned and operated.

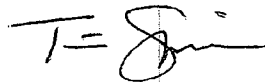
To continue CRMA's history of successful intervention, the CRMA Board of Directors requests that each CRMA member company* contribute an amount equal to ONE MONTH of their annual water bill to the CRMA Intervention Fund. The funds will be used exclusively to support legal and utility rate consultant services and other expenses incurred in presenting an effective intervention in the rate setting process. While members other than the large users have supported the intervention efforts in the past, it is important at this time, to get financial support from all members.

Please respond to this request by **December 1** if possible, since we must know by that date if there is sufficient support to continue in the intervention process. Our strong and concerted effort in this intervention is important to you, our member's prosperity, both now and in the future.

If you have questions concerning this request or the utility rate setting process, please call the CRMA office.



Dan Nuckolls
CRMA Board Chairperson



Tim L. Spires
CRMA President and CEO

* CMA member-companies who do not use large volumes of water, or whose water service is provided by another utility also have an interest in this matter, since most CMA member companies have employees, customers, or suppliers who will be impacted by this rate increase.

Tim Spires

From: Tim Spires [tspires@cma1902.com]
Sent: Tuesday, November 30, 2010 8:58 AM
To: tspires@cma1902.com
Subject: Water Intervention Notification - Urgent Request

Attachments: Water Intervention Fund.pdf

Dear CRMA Member,

We are in urgent need of your help. As you are aware from our November 10, 2010 email, we are preparing for our rate intervention of the petition filed by the Tennessee American Water Company (TAWC) to the Tennessee Regulatory Authority (TRA) requesting another increase in revenue. As mentioned by many parties, this request of \$9.984 million, relating to nearly a 28% increase, is the highest on record and believed to be unfair and unreasonable.

Attached you will find the letter explaining the impact of this rate increase on your business operations and a request for your help in this intervention. Our success in this matter is dependent upon the funding support we receive from our members. In order for us to properly prepare for this case, we need to know of your support this week.

If we do not receive enough funds to properly support the legal and analysis costs to fight this rate increase, we will need to withdraw our petition for intervention. If this should occur, we will be at the mercy of the other interveners and the TRA. Please carefully read the attached document and strongly consider lending your financial support in this very important intervention effort.

Please do not hesitate to call me if you have any questions.

Kind regards,

Tim L. Spires
President and CEO

Chattanooga Regional Manufacturers Association
tspires@cma1902.com
www.cma1902.com

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No virus found in this message.

Checked by AVG - www.avg.com

Version: 10.0.1170 / Virus Database: 426/3288 - Release Date: 11/29/10

Tim Spires

From: Tim Spires [tspires@cma1902.com]
Sent: Wednesday, December 22, 2010 2:43 PM
To: 'Tim Spires'
Subject: TAWC Intervention

Dear Intervention Members,

We are preparing with our consultant for the intervention, Brubaker and Associates, to do a cost of service analysis on large users. Since you fall inside the top 25 users of TAWC, we need your help and support in providing information for our analysis. All information supplied will be confidential.

Could you please supply us PDF copies of your water invoices from TAWC from September 2009 to your most recent invoice? We need the actual invoice scan for the analysis to differentiate water and sewer costs, meter sizes, and other pertinent information.

Please respond to this email ASAP and let me know if you can provide the information requested. We must complete our analysis and file our testimony by January 5, 2011. You can email the scans back to me and I will forward them on.

Thanks for your help. I will be sending out an update on the intervention progress next week.

Tim L. Spires
President and CEO

Chattanooga Regional Manufacturers Association
tspires@cma1902.com
www.cma1902.com

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CRMA (2nd) – ATTACHMENT 13

SURVEY OF STATE AGENCY WATER LOSS REPORTING PRACTICES

FINAL REPORT TO THE AMERICAN WATER WORKS ASSOCIATION

January 2002

Prepared by
Janice A. Beecher, Ph.D.
Beecher Policy Research, Inc.

SURVEY OF STATE AGENCY WATER LOSS REPORTING PRACTICES FINAL REPORT TO THE AMERICAN WATER WORKS ASSOCIATION

January 2002

Prepared by
Janice A. Beecher, Ph.D.
Beecher Policy Research, Inc.

Introduction¹

There might have been a time when having a fair amount of lost or “unaccounted-for” water was pretty acceptable to water utilities. Finding and plugging leaks might not have seemed cost effective for a typical water system; that is, the perceived cost of detection and repair might have outweighed the perceived benefits of saving water. Many water systems also might not have metered or charged for certain kinds of uses.

Such practices are no longer accepted as the best management of water resources. Today, the commodity that water systems deliver has greater value than ever before. Extraction, treatment, storage, and pumping all add value to the water resource. Ignoring the value of water losses is no longer justifiable.² Given growing constraints on water resources and mounting infrastructure costs, it is more imperative than ever that water managers endeavor to account for the water that travels from the source to end users.

While lacking a rational structure for quantifying water loss, numerous assessments in the literature suggest that water loss is a significant, and often overlooked, occurrence for many US water utilities. Many case studies have documented systems for which losses from leakage and poor accounting constitute substantial portions of total water deliveries.

A growing number of communities are faced with pressure to find additional supplies to serve expanding populations. Many of these exist in water-limited regions where the development of new supply sources and the allocation of existing sources are complex and sensitive issues. Yet rational assessment of water-loss performance and appropriate improvements often are not pursued as a resource management option or given appropriate priority.

¹ Based on George Kunkel and Janice A. Beecher, *Survey of State Agency Water Loss Reporting Practices: Preliminary Findings*. Proceedings of the 2001 AWWA Annual Conference (Denver: CO: American Water Works Association, 2002).

² George Kunkel, “Cutting Our Losses,” *Journal AWWA* (January 2001): 40.

Proper management of any resource must include accurate measurement of the resource throughout its life cycle. In any proper accounting system checks and balances must be provided via the use of independent audits, consistent reports and rational procedures. U.S water systems do not consistently account for water or apply consistent methods of water accounting. The need for a reliable and authoritative system of water accounting has become increasingly apparent to utility managers and practitioners in the field of water-resource policy.

This paper describes the findings of a research project sponsored by the Technical and Educational Council of the American Water Works Association that provides an initial baseline of data describing the status of water accounting and related public policy at the state and regional levels. The results are summarized in this paper and the detailed findings by jurisdiction are available in a spreadsheet format.

Water Accounting

Many water providers in the United States refer to the term “water accountability” as the measure of effectiveness in moving their product (water) to their customers with minimal losses in transmission and distribution. Water accountability, however, is not a well-defined discipline and the methodologies used to quantify losses are varied and inconsistent. Lack of standard terminology and measures are at the center of the water-loss penumbra.³ Often quoted, but poorly defined, the “metered-water ratio” more frequently confuses rather than informs the reader when attempting to evaluate the water loss condition of suppliers.

Confusing terms and standards can make it difficult for water professionals to address water-loss issues. The terminology used to represent the difference between the water that is withdrawn from the source and water that is eventually distributed to end users is imprecise. For example, the terms “water losses” and “unaccounted-for water” have been used somewhat interchangeably. But not all unaccounted-for water is lost; some might be given away or used for authorized purposes. Some water has been labeled “nonrevenue” or “nonrevenue producing” but such water might include both authorized and unauthorized uses.⁴ EPA has used the term “uncompensated usage” to include water used by public authorities, water used for maintenance purposes (flushing), leakage, and uncollected accounts from customers.⁵

In a 1987 study for the American Water Works Association Research Foundation (AWWARF), a useful distinction was made between “account” and “nonaccount” water: *Account water* is all water for which an account exists, the water is metered,

³ Ibid.

⁴ Janice A. Beecher and Patrick C. Mann, *Cost Allocation and Rate Design for Water Utilities* (Columbus, OH: The National Regulatory Research Institute, 1990).

⁵ U.S. Environmental Protection Agency, *Community Water System Survey* (Washington, DC: USEPA, 1997).

and the account is billed: *nonaccount water* is the sum of all water produced or purchased by a water utility that is not covered by the term "account water."⁶

This proposed nomenclature has not been widely internalized by U.S. water systems. For the most part, the industry and state agencies tend to use the term "unaccounted-for water" to mean leaks as well as other kinds of avoidable losses relative to total water production. However, the measurement of unaccounted-for water can be a source of confusion because the numerator and the denominator used to calculate the percentage are not obvious. Is the percentage amount supposed to represent all water not metered and sold or only water lost through leaks? How the percentage is calculated is obviously meaningful.

The confusion about terms exacerbates the confusion about standards. Any single standard (expressed in terms of volume or a percentage) for unaccounted-for water may not be valid, realistic, or appropriate for a particular water system. Many system characteristics—such as size, age, service population density, physical terrain, soil characteristics, and pipe materials—will affect leakage rates. Systems also have different production-cost profiles against which the cost-effectiveness of leak detection and control programs can be evaluated.

In 1996, AWWA's Leak Detection and Accountability Committee recommended 10 percent as a benchmark for unaccounted-for water, supplanting a 15 percent standard that apparently was based more on folklore than rigid empirical analysis.⁷ But even this 10 percent recommendation is considered arbitrary in nature and the use of any percentage loss indicator is now viewed as suspect; particularly in light of emerging approaches that rest on more accurate water accounting.

The AWWA Committee concluded that, "Regardless of the water system's size, water loss should be expressed in terms of actual volume, not as a percentage."⁸ This volumetric measure, the committee points out, is essential for estimating the monetary value of losses. The volumetric measure of lost water can be multiplied by the unit cost of water production (or the retail rate) to estimate the value of the lost water. From an economics perspective, the true value of losses is the *marginal* or *incremental* unit cost of production (that is, the cost of producing the next increment of drinking water supply). Incremental or marginal costs more accurately reflect water's resource value, which will increase as supply alternatives become scarcer. Reducing leakage and loss can help systems capture a supply resource and avoid costly supply-side operating and capital costs.

⁶ Lynn P. Wallace, *Water and Revenue Losses: Unaccounted for Water*. Denver, CO: American Water Works Association, 1987.

⁷ AWWA Leak Detection and Water Accountability Committee, "Committee Report: Water Accountability," *Journal AWWA* (July 1996): 108-111.

⁸ *Ibid.*, 110.

Although widely applied, the concept of “unaccounted-for water” is troubling from a best-practices perspective, as well as from perceptual viewpoint; professional water managers should be able to “account for” their inventory using appropriate measurement and estimation tools. Recently a task force of the International Water Association (IWA) created a new methodology and set of performance indicators for water loss.⁹ These measures, which can be applied internationally, recommend against the use of the term “unaccounted-for” water, based on the premise that *all* water should be accounted-for, as either a use or a loss. Most analysts agree a better system of *accounting* is the foundation for a better system of *accountability* for the drinking water supply industry.

Goals of the Project

The major goal of this project is to determine the extent to which state and regional agencies have established politics related to water loss and water-loss management. By making a comprehensive and systematic assessment of current policy, the project will help establish a baseline of understanding that can be used to evaluate the validity of the widely held perception that greater consistency is needed in water accounting for U.S. water utilities.

Approach

A survey was designed for completion by any state agency that might play a role in establishing or implementing a policy regarding water losses. State agencies that were contacted included drinking water administrators, natural resource agencies, and public utility regulatory agencies. Regional (multistate and substate) agencies, such as the Delaware River Basin Commission and the Florida water management districts (respectively), were also surveyed on a limited basis. A copy of the survey is included as Appendix A.

The survey results were supplemented by a document search and a review of state web sites to collect general information on state policies, including, but not limited to state laws and regulations, definitions, standards, and accounting requirements.

Survey information was gathered from various agencies representing thirty-four states, as well as the Delaware River Commission, the Southwest Florida Water Management District (SWFWMD FL), and the St. Johns River Water Management District (SJRWMD FL) (for a total of 37 completed surveys). Information on water loss policies was acquired for an additional eleven (11) state jurisdictions for which no survey was completed. Accordingly, the study includes information for forty-six (46) jurisdictions, including forty-three (43) states (See Table 1 and Figure 1).

⁹ International Water Association, *Performance Indicators for Water Supply Services* (London: International Water Association, 2000).

Although not entirely complete or representative, the results provide relatively good coverage of state water-loss policy development.

Table 1
State Water Loss Policy Survey Coverage (December 2001)

State or Regional Government	Survey	Other Information Sources
Alabama		
Alaska	X	
Arizona	X	Web search
Arkansas		
California	X	Document search
Colorado		
Connecticut	X	Web search
Delaware	X	Web search
Florida	X	Web search
Georgia	X	Web search
Hawaii	X	Web search
Idaho	X	2 surveys
Illinois		
Indiana	X	Web search
Iowa	X	Web search
Kansas	X	Web search
Kentucky	X	Document search
Louisiana		Web search
Maine	X	
Maryland	X	Document search
Massachusetts		Document search
Michigan		
Minnesota	X	Web search
Mississippi		
Missouri	X	
Montana	X	
Nebraska	X	
Nevada	X	Document search
New Hampshire	X	
New Jersey	X	
New Mexico		Document search
New York		Web search/Document search
North Carolina	X	Web search
North Dakota	X	
Ohio	X	2 surveys/ Web search
Oklahoma		
Oregon	X	
Pennsylvania	X	2 surveys
Rhode Island	X	
South Carolina	X	
South Dakota	X	

Table 1 (continued)

State or Regional Government	Survey	Other Resources
Tennessee		Document search
Texas	X	Web search
Utah		Web search
Vermont	X	Web search
Virginia		Document search
Washington		Web search
West Virginia		Web search
Wisconsin	X	Document search
Wyoming	X	Web search
Delaware River Basin Commission	X	
Southwest Florida Water Mgmt. Dist.	X	
St. Johns River Water Mgmt. Dist.	X	
TOTAL	37	29

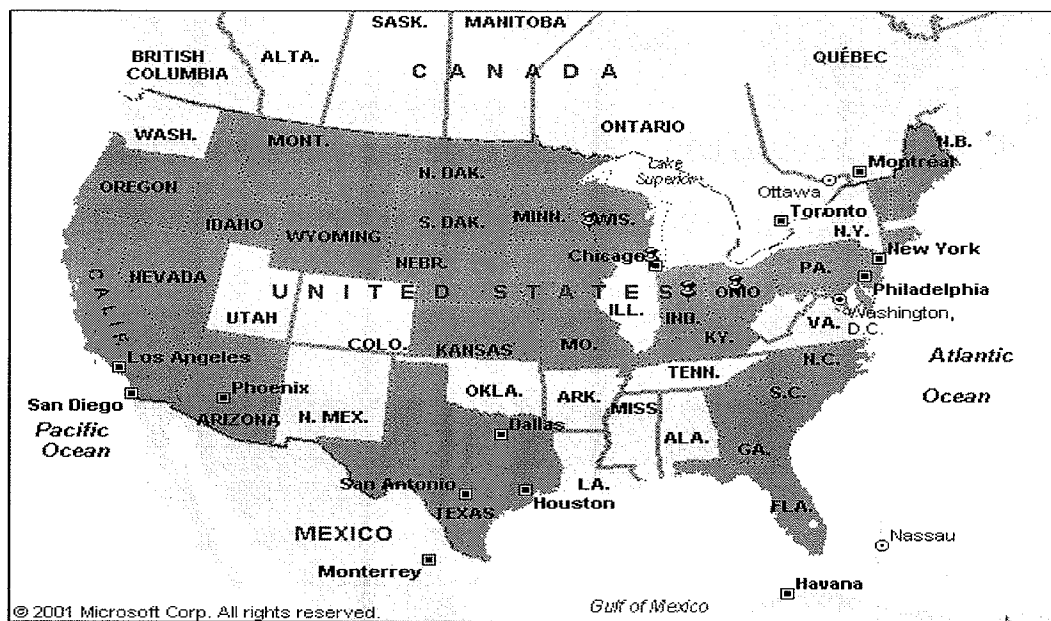


Figure 1. Survey respondents (state jurisdictions).

Survey Design

The survey on state water loss policy, as well as the supplemental research, was designed to be very simple and straightforward in order to ensure a high rate of response. Ten issue areas, which emerged from the preliminary research phase of the project, were covered by the survey:

1. Water-loss policy. Does the state have a policy regarding the loss of water by water utility systems? If so, where is the policy stated (statute, regulation, directive, etc). Which agency or agencies are responsible for implementing the water loss policy?
2. Definition of water loss. Does the state or agency provide a definition of water loss or unaccounted-for water?
3. Accounting and reporting. Does the state or agency provide a method to account for and report water loss?
4. Standards and benchmarks. Does the state or agency identify a standard or benchmark for water losses, such as a specific percentage?
5. Goals and targets. Does the state or agency specify a goal or target for water-loss reduction?
6. Planning requirements. Does the state or agency address water-loss issues in the context of water resource, conservation, or other planning requirements?
7. Compilation and publication. Does the state or agency compile and/or publish data on water losses by water utility systems?
8. Technical assistance. Does the state or agency provide any form of direct technical assistance to water utility systems to help reduce water losses?
9. Performance incentives. Does the state or agency provide any form of performance incentive for water-loss reduction?
10. Auditing and enforcement. Does the state or agency implement any form of auditing or enforcement in relation to the water-loss policy?

Survey respondents were asked to provide additional information for affirmative responses to any of the survey questions. Follow-up contacts with some respondents helped provide additional information as needed.

Finally, in addition to the survey, case studies were developed for six jurisdictions in order to highlight various aspects of water-loss policy development:

- Arizona Department of Water Resources
- Kansas Water Office
- Minnesota Department of Natural Resources, Division of Waters
- Pennsylvania Public Utility Commission and Pennsylvania Bureau of Water Supply and Wastewater Management
- Delaware River Basin Commission (interstate)
- St. Johns River Water Management District (intrastate Florida)

Survey Findings

Water-Loss Policy

Whether a state or agency has a water-loss policy is defined very liberally. Survey respondents were asked to indicate the existence of a policy. However, a policy was also assumed if information was found in any official state document. A water-loss policy can thus range from one that simply encourages utilities to reduce losses to one that specifically defines water loss, sets standards, requires reporting, and enforces compliance. Based on these broad criteria, the presence of a water-loss policy was detected for thirty-three (33) states plus the two surveyed Florida Water Management Districts and the Delaware River Basin Commission (for a total of 36 jurisdictions).

Water loss policies are most commonly found in a variety of state administrative codes, rules, and statutes. State agencies frequently reiterate and emphasize water loss policies in pamphlets, manuals, official forms, and memoranda of understanding. These can be useful information sources for understanding a particular agency's water loss policy.

As expected, the survey results indicate that the agencies responsible for water loss policy vary from state to state. Typically, the agency with responsibility in this area will be the state water resource, natural resource, or environmental agency that has jurisdiction for water-quantity issues. To a lesser extent, some state public utility commissions also implement water-loss policies. Least involved in water-loss policies are the state drinking water administrators, the primacy agencies for water-quality concerns.

Definition of Water Loss

According to the survey, seventeen (17) jurisdictions provide a definition of water loss or unaccounted-for water (including the St. Johns River Water Management District and the Delaware River Basin Commission). For the most part, these definitions do not provide for an operational measurement of unaccounted-for water. Most of the definitions differentiate between metered versus unmetered water. For

example, the Georgia Environmental Protection Division defines unaccounted-for water as “the difference between the total amount of water pumped into the water system from the source(s) and the amount of metered water use by the customers of the water system expressed as a percentage of the total water pumped into the system” (Rules and Regulations of the State of Georgia Chapter 391-3-2-.02 Definitions, Amended).

The California Department of Water Resources distinguishes between authorized unmetered uses and water losses. Authorized unmetered uses may include water used for beneficial purposes, such as fire fighting and main flushing. Most definitions identify some of the potential sources of unaccounted-for water, including water for fire fighting and flushing, leaks and breaks, illegal connections, faulty meters, and other sources.

The Massachusetts Department of Environmental Protection uses a detailed definition provided by a sister agency, the Water Resources Commission, to define unaccounted-for water as: “the difference between water pumped or purchased and water that is metered or confidently estimated. Unaccounted for water should include, meter problems (i.e. master meter inaccuracies, domestic and non-domestic meter under-registration, etc.), unauthorized hydrant openings, unavoidable leakage, recoverable leakage, illegal connections, stand-pipe overflows and data processing errors.”

Three state agencies in the sample provide worksheets or formulas for calculating unaccounted-for water. The Missouri Department of Natural Resources defines water loss as a simple percentage: $((\text{water pumped} - \text{water used}) / (\text{water pumped})) \times 100$. Total usage is the sum of customer meter readings, volume used for main flushing or fire hydrant testing, volume sold through water salesman or truck loads from fire hydrants, volume used to fill swimming pools not otherwise metered, etc.

The Texas Water Development Board provides a worksheet for systems to calculate unaccounted-for water, which can be summarized in three steps:¹⁰

- (1) The volume of water produced or supplied to the distribution system, as measured by all master meters at wells and treatment facilities or points of purchase from other utilities, is totaled.
- (2) The volume of water sold and distributed as measured by sales meters and estimated un-metered uses.
- (3) Unaccounted-for water is obtained by subtracting water sales from total water produced supplied.

¹⁰ Texas Water Development Board, *A Guidebook for Reducing Unaccounted-for Water* (Texas Water Development Board, June 1997), 2.

Texas also defines unaccounted-for water as production minus sales (and the percentage of unaccounted-for water as unaccounted-for water divided by water produced times 100).

The Pennsylvania Department of Environmental Protection defines unaccounted-for water as generally "water which is produced but is not used or sold to the consumers."¹¹ The percent of unaccounted-for water is then specified in a basic calculation:

$$\text{Percent of Unaccounted for Water} = \frac{(\text{Water Available for Sale}) - (\text{Water Sold or Used})}{\text{Water Available for Sale}} \times 100$$

Accounting and Reporting

Most water professionals agree that all water systems, even smaller systems, should implement a basic system of water accounting. AWWA provides a manual, *Water Audits and Leak Detection* (M36, 1990) to guide this process.¹² Water accounting facilitates the process of tracking water throughout the transmission and distribution system—from water sources to end users—and also identifies areas that may need special attention, such as the existence of large volumes of nonaccount water.

The survey indicates that twenty (20) state agencies and the two Florida water management districts either require or provide guidelines for water accounting and/or reporting water loss. Accounting and reporting may be part of an annual report requirement to an agency or may be required as part of an application process. Several examples illustrate the diversity in accounting and reporting.

The Environmental Protection Division of the Georgia Department of Natural Resources requires, as part of a permit to withdraw ground and surface water, submission of an annual water-use data report that includes information on unaccounted-for water for the prior twelve (12) months.

The Iowa Department of Natural Resources Water Supply Section Construction Permit Application requires applicants to provide data for unaccounted-for water (on an average-day and peak-day basis).

In addition to reporting requirements for unaccounted-for water, three state agencies also require a statement of how the utility plans to remedy the situation. In

¹¹ Pennsylvania Department of Environmental Protection, *Public Water Supply Manual – Part 5 (Appendix A)*, November 1, 1997.

¹² Several water conservation planning manuals also have suggested systems of water accounting. One that contributed to the method proposed in this article appeared in the *Water Conservation Manual* published by the New York State Department of Environmental Conservation (January 1989).

its Annual Statistical Report for Community (COM) Public Water Systems and Non-Transient Non-Community (NTNC) Public Water Systems, the Massachusetts Department of Environmental Protection requires systems to identify the reasons for the unaccounted-for water, as well as the measures that will be implemented to correct the problem. According to the required form:

If your system has 15% or greater unaccounted water or uses 100,000 gallons per day or greater and has any % unaccounted for water, please indicate in the table below the possible reason(s) for your unaccounted for water and your plans to correct these problems. Please note that during or before your next Sanitary Survey DEP staff will evaluate your progress with the corrective actions plans as indicated.¹³

In a like manner, the Ohio Public Utility Commission requires each waterworks company to annually report unaccounted-for water and also to propose remedial actions if unaccounted-for water exceeds 15 percent. The West Virginia Public Service Commission also requires a statement of remedial actions to be taken if the utility indicates unaccounted-for water greater than 15 percent in its annual report.

The New York Department of Health requires water suppliers to prepare an annual Drinking Water Quality Report that includes an accounting of the total amount of water withdrawn, delivered, and lost from the system. The Texas Water Board provides detailed worksheets for calculating unaccounted-for water in their Drought Planning Guide. Finally, the Public Service Commission of Wisconsin requires utilities to maintain an ongoing record that compares water pumpage with metered consumption.

Standards and Benchmarks

The imprecision of the definitions of water losses carries over to the establishment of standards and benchmarks. The survey confirmed the lack of clear consensus on standards. Twenty-eight agencies (representing twenty-three states and the three regional authorities) reported the use of some standard or benchmark for water losses. Table 2 presents standards for “unaccounted-for water” from a select number of jurisdictions. The reported standards range from 7.5 to 20 percent, with 15 percent being most common. The percentages refer generally, but rather vaguely, to water losses relative to production.

¹³ Massachusetts Department of Environmental Protection, “2001 Public Water System Annual Statistical Report for Community (COM) Public Water Systems and Non-Transient Non-Community (NTNC) Public Water Systems.” <http://www.state.ma.us/dep/brp/dws/files/comntnc.doc>

Table 2
Selected State Standards for Unaccounted-for Water

State	Agency	Standard
Arizona	Department of Water Resources	10% (large) 15% (small)
California	Urban Water Conservation Council	10%
Florida	Southwest Florida Water Management District	12% or less
Florida	St. Johns River Water Management District	10%
Georgia	Environmental Protection Division	Less than 10%
Indiana	Department of Environmental Management	10 to 20%
Kansas	Kansas Water Office	15%
Kentucky	Department of Energy, Water and Sewer Branch	15%
Louisiana	Department of Environmental Quality	15%
Massachusetts	Department of Environmental Protection	15%
Minnesota	Department of Natural Resources	10%
Missouri	Department of Natural Resources	10%
North Carolina	Division of Water Resources	15%
Ohio	Public Utility Commission and Environmental Protection Agency	15%
Oregon	Water Resources Division	10-15%
Pennsylvania	Public Utility Commission	20%
Pennsylvania	Bureau of Water and Wastewater Management	10-15%
Rhode Island	Water Resources Board	10-15%
South Carolina	Public Service Commission	7.5%
South Carolina	Department of Health and Environmental Control	10%
Texas	Water Development Board	10 to 15%
Texas	Natural Resources Conservation Commission	20%
Washington	Department of Health	20% (10% proposed)
West Virginia	Public Service Commission	15%
Wisconsin	Public Service Commission	15% (large) 25% (small)
Delaware River Basin Commission	Delaware River Basin Commission	15%

Source: Survey of states.

According to the review, only Arizona, Texas, and Wisconsin established different standards for water systems based on their type or size. The Texas Water Development Board, for example, has found that "unaccounted for water rates above 15 percent for municipal systems and slightly higher (15% to 18%) for wide-spread rural systems indicate the need for immediate actions."¹⁴

Goals and Targets

Eighteen (18) state agencies and the two Florida water management districts mentioned a goal or target for water-loss reduction. In most cases the goal or target is for the utility to meet the standard or benchmark for unaccounted-for water discussed in the previous section. Goals often are stated in relatively vague terms.

For example, the Florida Department of Environmental Protection, Water Resource Implementation Rule declares that, "The overall water conservation goal of the state shall be to prevent and reduce wasteful, uneconomical, impractical, or unreasonable use of water resources..." "Districts shall further accomplish this water conservation goal by:...3. Minimizing unaccounted for water losses..."¹⁵

The Minnesota Department of Natural Resources provides a time period target of three years for a water supplier to reduce unaccounted-for water:

If unaccounted-for water exceeds 20% of total water appropriations the public water supplier's water appropriation permit is amended to require the implementation of measures to reduce unaccounted-for water volumes within 3 years. The generous targets of 20% and 3 years are intended to provide sufficient time and resources for small systems...¹⁶

The Kansas Water Office is the only agency in the sample to specify a particular target year. The agency plans to reduce the number of public water suppliers with excessive unaccounted-for water by the year 2010.

Planning Requirements

For twenty-seven (27) of the agencies in the sample, water-loss issues are addressed in the context of planning requirements. In almost every case, the planning requirement is for water conservation, supply, or emergency planning. For example, the Connecticut Department of Health requires water suppliers to

¹⁴ Texas Water Development Board, 2.

¹⁵ Florida Statute, CHAPTER 62-40 Water Resource Implementation Rule 62-40.412 Water Conservation. <http://www.dep.state.fl.us/water/rules/62-40.pdf>

¹⁶ Jim Japs, Supervisor, Water Permit Programs, MN Department of Natural Resources, Division of Waters, survey information.

discuss current leak detection and repair and pressure-reduction programs in their Water Supply Plans. In Nevada each water supplier must "identify and reduce leakage in water supplies, inaccuracies in water meters and high pressure in water supplies"¹⁷ in its required water conservation plan. In Vermont, the Department of Environmental Conservation requires systems to prepare a water conservation plan that, "at a minimum, addresses the following: (a) evaluation of system water use efficiency, including evaluation of extent of unaccounted-for water, water accounting, and loss control."¹⁸

The Texas Natural Resources Conservation Commission includes more specific requirements in their water conservation plans:

All water conservation plans for municipal uses by public drinking water suppliers shall include the following elements:
(E) measures to determine and control unaccounted-for uses of water (for example, periodic visual inspections along distribution lines; annual or monthly audit of the water system to determine illegal connections, abandoned services, etc.). For Systems serving 5,000 or more population the plan must include "a program of leak detection, repair, and water loss accounting for the water transmission, delivery, and distribution system in order to control unaccounted-for uses of water" For wholesale water suppliers, plans must include goals for "maximum acceptable unaccounted-for water"¹⁹

New Hampshire and Virginia require water-loss management plans in connection with all new groundwater withdrawals. The Kansas Water Office requires a water utility to implement a water management review every time the amount of unsold water exceeds 20 percent of the total raw-water intake for a four-month time period.

Compilation and Publication

Only nine state agencies and one Florida water management district appear to compile or publish data on water losses. Two agencies, the Hawaii Department of Water Supply and the Southwest Florida Water Management District compile water loss data but do not publish this information for public consumption. In some states, such as Minnesota, water-loss data is only available through annual reports or planning documents. The Kansas Water Office compiles data on unaccounted-for water and publishes it in the Kansas Municipal Water Use Report, which is available

¹⁷ Nevada Revised Statutes (NRS), NRS 540.141.

¹⁸ Vermont Environmental Protection Rules, Chapter 21, revised December 29, 2000: Appendix B, Long Range Plan Requirements.

<http://www.anr.state.vt.us/dec/watersup/wsrule/WSRuleDecember2000.pdf>

¹⁹ Texas Rules, Chapter 288 Subchapter A: Water Conservation Plans 288.1-288.6 Effective April 27, 2000. <http://www.tnrcc.state.tx.us/oprd/rules/pdflib/288a.pdf>

online. The office currently lists sixty-one (61) systems with unaccounted-for water amounting to 30 percent or more.

Technical Assistance

Eighteen (18) state agencies and one Florida water management district in the sample provide some amount of technical assistance to water utility systems to help reduce water losses. In Kansas, technical assistance is provided to any public water supplier upon request. The Kansas Rural Water Association provides on-site technical assistance at no charge. In Texas, technical assistance, classes, and training are available from a number of providers, including the Texas Natural Resources Conservation Commission, Texas Water Development Board, Texas Water Utilities Association, the Texas Engineering Extension Service, and the Community Resource Group.

The Kentucky Infrastructure Authority implements a program to assist systems in detecting water losses from distribution lines. The program includes both audits and low-interest loans:

The authority shall establish a program to assist governmental agencies in detecting water loss from distribution lines. The program may include contracting with third parties to conduct water loss audits and leak detection. The program may include giving low interest loans, on a priority basis established by the authority consistent with the findings and purposes set out in section 1 of this act, for the repair or replacement of distribution facilities, deemed reasonable by the authority, undertaken as a result of the water loss audit.²⁰

Performance Incentives

Only eleven (11) state agencies and one Florida water management district in the sample indicated the use of performance incentives for water loss reduction, broadly defined for the purpose of this study. Minnesota and Rhode Island consider the approval of a conservation plan or permit as a performance incentive. The Rhode Island Water Resources Board, for example, requires attention to water-loss reduction for approval of Water System Supply Management Plans. The Vermont Department of Environmental Conservation reported that fees might be slightly lowered as incentive for water-loss reduction. The Texas Natural Resources Conservation Commission, a price regulator for some systems, reports that a system's rate of return may be affected by excessive line losses.

²⁰ 2000 Ky. Acts 529; 2000 Ky. Ch. 529; 2000 Ky. SB 409

Four states (Indiana, Iowa, Louisiana, and North Carolina) mention water losses in their state revolving loan fund (SRF) applications. In some instances, higher rates of water loss might actually result in greater benefits. For example, Louisiana assigns extra points to loan applicants experiencing unaccounted-for water greater than 15 or 25 percent. Although such incentives might appear “perverse,” the intention is to identify systems most in need of assistance. Moreover, loan provisions generally require a plan to reduce losses.

Thus, Iowa assigns ten points to SRF applicants that plan to rectify excessive water losses per the established water conservation plan if unaccounted-for water is more than 15 percent. North Carolina’s funding programs place a particular emphasis on water losses. The Drinking Water Treatment Fund awards up to 20 points for projects that replace undersized or leaking water lines. For the state’s Clean Water Bond Loan Program and Clean Water Revolving Loan and Grant Program, five points are given if “An applicant demonstrates it has a continuing water loss program in its water supply system program.”²¹

Auditing and Enforcement

Fifteen (15) agencies in the sample call for some type of auditing or enforcement. Generally, these policies are basic auditing requirements. None of the jurisdictions covered by the survey were found to impose direct sanctions (such as fines) on systems failing to meet water-loss related requirements.

Auditing includes any agency review of the water utility’s annual report or planning documents. Utility’s might also be required to conduct a periodic water audit. For example, the St. Johns River Water Management District requires all consumptive use permit applicants to complete a water audit, paying special attention to unaccounted-for water:

If the total unaccounted for loss of the system from line 4F is 10% or greater, the applicant is required to evaluate the feasibility of completing the leak detection survey found on the water audit form. The applicant has the option to perform the leak detection immediately or to propose a one year program to improve water use accountability to below 10% and then to repeat the audit. If the second audit shows unaccounted-for water loss above 10%, the permittee must implement the leak detection program where feasible.²²

²¹ North Carolina Public Water Supply Section, Chapter 1 - Departmental Rules, Subchapter 1 L - State Clean Water Bond Loan Program Section 0.100 - General Provisions

²² St. Johns Water Management District, *Instructions for Completing the District Water Audit Form*.

The Minnesota Department of Natural Resources audits annual reports and also requires an audit of unaccounted-for water when reviewing each permit request. Public water suppliers with losses exceeding 20 percent must provide an annual report of actions being implemented to reduce unaccounted-for water. The Kansas Rural Water Association closely audits all public water suppliers with 30 percent or more unaccounted-for water. Quarterly monitoring is required until two consecutive quarterly reports show 20 percent or less unaccounted-for water.

As an example of potential enforcement, the Ohio Public Utility Commission requires a water company to notify the Commission if it cannot comply with water-loss requirements. The company is given thirty days to take corrective actions and submit a report to the Commission. "The compliance division of the commission shall, after reviewing the report, notify the company of any further necessary actions."²³

Case Studies

Six cases are highlighted here because they represent significant water-loss policy developments at the state and regional levels.

Arizona Department of Water Resources

Most water-loss requirements in Arizona are implemented through the states five Active Management Areas (AMA). Each AMA must submit a yearly Management Plan, which requires all municipal suppliers to report their unaccounted-for water.

Arizona applies a relatively specific working definition of unaccounted-for water:

Lost and unaccounted for water is defined as the total water from any source, except direct use effluent, withdrawn, diverted, or received in a year minus the total amount of authorized deliveries made by the municipal provider in that year.²⁴

Lost and unaccounted-for water includes leaks (from distribution lines, sewer lines, storage tanks, storage ponds, hydrants), breaks (from distribution lines, sewer lines, mains, hydrants), measurement errors (meter under/over-registration, source meter errors, flumes/weirs errors), evaporation, illegal connections/water theft, and phreatophyte uses.²⁵

²³ Ohio Administrative Rule 4901:1-15-22 OAC.

²⁴ Arizona Department of Water Resources, *Third Management Plan for Phoenix Active Management Area, 2000-2010*.

²⁵ Ibid.

Arizona is one of only two jurisdictions (along with Wisconsin) that has established different water-loss standards for small and large systems. Small municipal providers are required to maintain lost and unaccounted-for water at or below 15 percent while large municipal providers are required to maintain lost and unaccounted-for water at or below 10 percent. Large systems that are unable to operate and maintain their distribution systems to meet the 10 percent requirement are required to line all canals used to deliver untreated water to delivery points with a material that allows no more lost water than a well-maintained concrete lining.

All municipal providers are required to annually report to the Arizona Department of Water Resources the total quantity of lost and unaccounted-for water during the calendar year, as well as the percentage of water lost and unaccounted for.

Municipal providers also are required to include per-capita usage estimates in their yearly report, the calculation of which considers lost and unaccounted-for water. Lost and unaccounted-for water is calculated accordingly:

1. Subtract the calendar year total residential, non-residential, and system-related deliveries from the calendar year total non-irrigation water use to obtain the lost and unaccounted for water volume, in acre-feet.
2. Divide the lost and unaccounted for water volume by the total non-irrigation water use for the calendar year and multiply the result by 100.
3. If the product from D.1. is *less than* ten percent, the result is the volumetric allotment, in acre-feet, for lost and unaccounted for water for the calendar year; **or** if the product from D.1. is *greater than* ten percent, multiply the total water use for the calendar year by ten percent. The result is the volumetric **Lost and Unaccounted For Water Allotment**, in acre-feet, for the calendar year.²⁶

Kansas Water Office

Kansas has one of the most comprehensive programs for unaccounted-for water among the surveyed jurisdictions. The Kansas program for unaccounted-for water is articulated primarily through the state's annual water plan. The Kansas Water Office is mandated by law to "formulate on a continuing basis, a state water plan for the management, conservation and development of the water resources of the state."²⁷ The planning process is coordinated with various local, state and federal agencies, special interest groups, and the general public:

²⁶ Ibid.

²⁷ State Water Resource Planning Act (K.S.A. 82a-903 *et seq.*).

The Kansas Water Office defines unaccounted for water as... the amount of water that a public water supplier pumped and/or purchased from other entities; minus all metered amounts (either sold or distributed free). Metered amounts include sales to other public water suppliers; large industrial, bulk or livestock water users; and residential and commercial customers; as well as metered free water (such as swimming pools, golf courses, community buildings, water treatment process, etc).²⁸

One of the two primary objectives of the Kansas Water Plan is to, "By 2010, reduce the number of public water suppliers with excessive 'unaccounted for' water by first targeting those with 30 percent or more 'unaccounted for' water."²⁹ In addition to the focus on systems with very high losses, the plan also targets systems with losses exceeding 15 percent because "15% was the average percent of unaccounted for water for public water suppliers in 1997, and is a reasonable amount for unfinished water."³⁰

Water suppliers are required to report their unaccounted-for water in an annual water report. Failure to submit an annual report is subject to a fine and providing false information is considered a class C misdemeanor. Furthermore, most water suppliers are also required to submit a water-conservation plan. One of the long-term water-use efficiency practices required of water utilities is the implementation of:

... a water management review, which will result in a specified change in water management practices or implementation of a leak detection and repair program or plan, whenever the amount of unsold water (amount of water provided free for public service, used for treatment purposes, water loss, etc.) exceeds 20 percent of the total raw water intake for a four month time period.³¹

The Kansas Municipal Water Use Report keeps a current compilation of all water losses in the state of Kansas. The annual and average percent of unaccounted-for water for all public water suppliers in the state is compiled and published by the Kansas Water Office.³²

²⁸ The Kansas Water Office, "2010 Objectives Basin Assessment, Unaccounted For Water Assessment." <http://www.kwo.org/assess/unaccount/main.html>

²⁹ The Kansas Water Office, "The Kansas Water Plan, Fiscal Year 2003,' July 2001. <http://www.kwo.org/kwp/fy2003kwp.html>

³⁰ *ibid.*

³¹ The Kansas Water Office, "Kansas Municipal Water Conservation Plan Guidelines." http://www.kwo.org/reports/1990_WCP_Guidelines/index.htm

³² This report is available online at http://www.kwo.org/reports/1999_mwur/index.htm.

Kansas is also one of the few states surveyed that operates a program for technical assistance for water suppliers to reduce water losses. The Kansas Water Office funds on-site technical assistance through the Kansas Rural Water Association to suppliers with 30 percent or more unaccounted-for water. Assistance includes leak detection, meter testing and replacement, and bookkeeping reviews. Technical assistance for preparing water conservation plans is also provided to public water suppliers.

Kansas has a strict auditing program for water suppliers with excessive water losses. The Kansas Rural Water Association monitors public water suppliers with 30 percent or more unaccounted-for water on a quarterly basis. Monitoring continues until two consecutive quarterly reports show unaccounted-for water of 20 percent or less.

The Kansas Water Office reports that their water-loss program has significantly reduced the amount of unaccounted-for water in the state. They project that the amount of unaccounted-for water in excess of 15 percent of total water use for Kansas will be reduced by 82 percent by the target year of 2010.³³

Minnesota Department of Natural Resources, Division of Waters

Minnesota's water-loss policy is implemented in conjunction with the state's requirement for water emergency and conservation plans. System plans must address demand-reduction measures associated with plan and permit approvals, as well as water losses and unaccounted-for water.³⁴ An approved water emergency and conservation plan is required as part of the Wellhead Protection Plan and for applications to the State Drinking Water Revolving Fund.

Despite the emphasis on the water-loss issue, Minnesota policy is not guided by clear operational definitions. Unaccounted-for water is simply defined as water withdrawals minus water sales. Water loss is one component of unaccounted-for water. According to a state official, water suppliers estimate their own water loss, using methodologies that are "inconsistent and some times questionable."³⁵

The Minnesota Department of Natural Resources (DNR) has required annual reporting of unaccounted-for water for communities serving more than 1,000 people since 1994. Because of inconsistent and questionable methodologies for determining unaccounted-for water, the Minnesota DNR has assumed the task of calculating unaccounted-for volumes based on total water withdrawals less water sales.

³³ The Kansas Water Office, "The Kansas Water Plan, Fiscal Year 2003," July 2001.
<http://www.kwo.org/kwp/fy2003kwp.html>

³⁴ See Minnesota Statutes 2001, 103G.291, Subd. 3 a-c.
<http://www.revisor.leg.state.mn.us/stats/103G/291.html>

³⁵ James Japs, Minnesota DNR Water, survey response.

Minnesota has set a standard for water losses at less than 10 percent. According to the state's water appropriation permit program:

Cities should establish a goal for unaccounted-for water (the AWWA recommends less than 10 percent) and monitor unaccounted-for water volumes each month or billing period. Water audit, leak detection, and repair programs should be implemented when unaccounted-for water is higher than the goal.³⁶

However, Minnesota has set a more lenient target for public water suppliers with high rates of water loss. "If unaccounted-for water exceeds 20% of total water appropriations the public water supplier's water appropriation permit is amended to require the implementation of measures to reduce unaccounted-for water volumes within 3 years."³⁷ It is believed that this more lenient goal will give small systems a reasonable amount of time and resources to reduce water loss.

The Minnesota DNR audits all annual water-report forms. Furthermore, an audit and evaluation of unaccounted-for water is conducted in connection with each permit request. If a public water supplier exceeds 20 percent unaccounted-for water, the system must provide an annual report of actions being implemented to reduce unaccounted-for water.

*Pennsylvania Public Utility Commission and
Pennsylvania Bureau of Water Supply and Wastewater Management*

In Pennsylvania, both the Public Utility Commission and the Bureau of Water Supply and Wastewater Management implement policies that address the issue of water loss. The Public Utility Commission, an economic regulatory agency, requires evidence of the reasonableness of unaccounted-for water claims greater than 20 percent. This policy was adopted in a general waterworks rate-case order. According to the order:

In the future, water companies with experienced unaccounted-for water of more than 20%, should be prepared to demonstrate by way of substantial evidence that their experience is both normal and reasonable. Such evidence may be a combination of engineering, operations or historical testimony and data, but

³⁶ Minnesota Water Appropriation Permit Program - "Conservation Measures for Water Supply Systems"

http://www.dnr.state.mn.us/waters/programs/water_mgt_section/appropriations/pwsconserve.html

³⁷ James Japs, Minnesota DNR Water, survey response.

it should consist of something more than unsupported or conclusory opinions by Company witnesses.³⁸

The Commission requires regulated water suppliers to submit data that complies with this directive, including a description of leak-survey programs. As part of their annual report to the Commission, systems are required to complete a form on water delivered into the system during the year. The form requires suppliers to report unavoidable leakage in terms of gallons-per-day per mile of main, located and repaired breaks in mains and services, total unaccounted-for water, and percentage of unaccounted-for water.

The Bureau of Water and Wastewater Management in the Pennsylvania Department of Environmental Protection (DEP) also regulates unaccounted-for water. The Public Water Supply Manual explains the department's water-loss policy and specifies the procedures for staff to follow when they review and evaluate public water supplier's Operations and Maintenance Plans.

Although the DEP defines unaccounted-for water simply as water that is produced but not sold or used, some detail is provided about the particular factors that should be considered when assessing unaccounted-for water:

1. The water produced – Is this quantity accurately determined, has the meter been calibrated, does the meter measure all of the water?
2. The water used for water system purposes such as chemical feed water, backwash water, fire hydrant and blow-off flushing – How is each of these uses measured?...
3. The water sold or used by the consumer must be accurately accounted for. A meter testing program should be in place to periodically test the accuracy of the meters. All consumer use must be accounted for...
4. Water used for fire fighting purposes – This water only can be estimated, but some careful calculations by the fire company and the water system can develop a reasonable value.³⁹

The calculation of unaccounted-for water involves subtracting the amount of water sold or used from the water available for sale. The DEP recommends using a one-year period for the calculation to mitigate the effects of metering and seasonal variations.

³⁸ Pennsylvania Public Utility Order, Dauphin Consolidated Water Supply Company @ R-79050616, July 2, 1981.

³⁹ Pennsylvania Department of Environmental Protection, Bureau of Water Supply Management, "Public Water Supply Manual – Part V," http://www.dep.state.pa.us/dep/subject/all_final_technical_guidance/bwsch/383-3110-111.htm

The Pennsylvania DEP recommends the AWWA standard of 10-15 percent for unaccounted-for water. However, the department also notes the relevance of a number of systems-specific considerations:

1. The age and condition of the system...A range of 35 to 40 percent may be acceptable until funds for replacement of mains is available;
2. The pressure in the system can affect the rate of leakage. Thus high pressure systems may have a higher percentage of unaccounted-for water;
3. The number of customers per mile of main can affect the unaccounted-for water. Therefore, if a system has a high ratio of miles of pipeline to the number of customers, the percentage of unaccounted-for water will increase;
4. Under-registration of customer meters or unauthorized uses can increase the percentage of unaccounted-for water.⁴⁰

Pennsylvania policy also expressly considers the economic value of water losses. The state recommends that systems "Calculate the cost of producing a thousand gallons or one hundred cubic feet of water and then calculate the amount of money which is being 'lost' as unaccounted-for water each month. By identifying this cost, you can justify the cost of the programs to correct the problem."⁴¹ Suggested programs include meter testing, leakage control program that focuses on detection, and record keeping to support a main-replacement program.

These requirements and recommendations are incorporated in the review and evaluation of the Operations and Maintenance Plans that public water suppliers must prepared in accordance with the DEP's drinking water management programs.

The DEP's Water Allocation Permit system also requires systems to implement a continuous water conservation program, which must include an ongoing leakage and loss control program. Permit holders must initiate a study to develop a plan to reduce unaccounted-for water within one year of the date of the permit and reduce losses to 20 percent or less within five years of the date of the permit.

Finally, the DEP provides free leak-detection services to water suppliers that agree to follow program requirements, including a yearly water audit through a partnership agreement with the Pennsylvania Rural Water Association.

Delaware River Basin Commission

The Delaware River Basin Compact was enacted in 1961 to address water-resource issues on a regional basis. The member states include Delaware, New Jersey, New York, and Pennsylvania. The governing commission is composed of

⁴⁰ Ibid.

⁴¹ Ibid.

five members, one from each state and one representing the federal government. The Delaware River Basin Commission (DRBC) has wide authority in the area of water-resource planning and management agencies in the basin. This authority extends to water efficiency and such areas as metering, conservation, billing, and water losses.

The DRBC policy on water loss is established in Resolution 87-6 (revised), requiring owners of water-supply systems serving the public to “undertake a systematic program to monitor and control leakage within their water supply system. Such program shall at a minimum include: periodic surveys to monitor leakage, enumerate unaccounted-for water, and determine the current status of system infrastructure; recommendations to monitor and control leakage; and a schedule for the implementation of such recommendations.” After the initial submission of a leak-detection and repair plan, systems are required to submit new plans every three years. Plans are submitted to the respective state regulatory agency for review and approval.

The DRBC uses a very simple calculation for water loss. Unaccounted-for water is the difference between the metered ratio and 100 percent. A standard of 15 percent water loss is suggested and systems that exceed this standard may be subject to more frequent reporting. According to one official, “DRBC’s regulatory objective is to reduce overall unaccounted-for water to 15 percent or less by 2020.”⁴²

Water loss is considered an integral part of the DRBC’s overall water-conservation programs. All water purveyors planning a new or expanded water withdrawal must submit a water-conservation plan that discusses source metering, service metering, leak detection and repair, and water conservation performance standards. Although the conservation plan provides no specific incentives for implementation, incentives are more direct in connection with withdrawals; new projects, such as new withdrawals, will not be approved until adequate leak detection and repair programs are implemented.

The DRBC does not provide direct technical assistance to water utilities to help reduce water losses. Nor does the commission require detailed water audits or exert substantial enforcement activity. Still, much of the progress in reducing water losses in the Delaware River Basin is attributed to the DRBC regulations.

St. Johns River Water Management District (Florida)

The St. Johns River Water Management District (SJRWMD) requires the issuance of permits for large-volume water users in accordance with the “Permitting of

⁴² Jeffrey Featherstone, “Conservation in the Delaware River Basin,” *Journal American water Works Association* (January 1996): 48.

Consumptive Uses of Water” rule.⁴³ All applicants for a consumptive-use permit must complete a thorough water audit. The water audit requires identification of water losses in the treatment process and in the distribution system. Applicants must identify all water uses, as well as total unaccounted-for water and the percentage of unaccounted-for water.

Conservation is required as part of all consumptive-use permits. In order to obtain a consumptive-use permit (CUP) from the SJRWMD, “all available water conservation measures must be implemented unless the applicant demonstrates that implementation is not economically, technically, and environmentally feasible.”⁴⁴ Water-loss reduction is a recognized water conservation measure. Permit applicants must also conduct a meter survey to account for and correct meter error if unaccounted-for water is 10 percent or greater based on the initial water audit.

SJRWMD has one of the strictest requirements for leak detection. According to the applicant’s handbook:

An applicant whose water audit...shows greater than 10% unaccounted for water use, must complete the leak detection evaluation portion of Form 40C-22-0590-3. Based upon this evaluation, an applicant may choose to implement a leak detection program immediately or develop an alternative plan of corrective action to address water use accountability and submit a new water audit to the District within two years. If the subsequent audit show greater than 10% unaccounted for water, the applicant must implement a leak detection and repair program within one year unless the applicant demonstrates that implementation is not economically feasible. In all cases, this evaluation and repair program may be designed by the applicant to first address the areas which are most suspect for major leaks. The evaluation and repair program may be terminated when the permittee demonstrates that its unaccounted for water loss no longer exceeds 10%.⁴⁵

The leakage evaluation must include the following items:

- ▶ Potential water system leakage
- ▶ Annual potential system leakage
- ▶ Recoverable leakage (assumes 50%)
- ▶ Production cost per million gallons
- ▶ Recoverable savings
- ▶ Estimated cost of leak detection survey
- ▶ Estimated recovery period

⁴³ Florida Administrative Code, Chapter 40C-2.

⁴⁴ Florida Administrative Code, Chapter 40C-2.301 (4).

⁴⁵ St. John’s River Water Management District, *Applicant’s Handbook: Consumptive Uses of Water, Chapter 40C-2, F.A.C.* <http://www.sjrwmd.com/Excite/index.html>.

The consumptive-use permit will not be issued until the applicant addresses water leaks and losses.

Conclusions

The results of the survey and analysis, summarized in Table 3, suggest a fair amount of state and regional policy activity regarding the issue of water losses. However, the prevailing policies are not entirely clear, consistent, or operational. Most of the identified policies are raising much-needed awareness of the loss issue and promoting better accounting and reporting, but most do not necessarily impose consequences through incentive or enforcement mechanisms.

The findings confirm the need to refine the definitions, measures, and standards for evaluating water losses. A uniform approach, advanced and adopted by authoritative organizations in the water industry, could play a vital role in policy development. It is not uncommon for public policies to refer to authoritative sources with regard to technical standards, such as those that might be developed for water losses.

A precursor to further policy development is the establishment of a uniform system of water accounting and the collection of valid and reliable data on water losses. Better accounting will promote a common understanding of the water-loss issue, as well as appropriate benchmarks and standards. Eventually, best practices for water accounting and loss management may emerge and find reflection in water-loss policies, as future surveys might reveal.

Table 3
Summary of Findings

Issue	Jurisdictions	States (n = 43)	Other (n = 3)	Total (n = 46)
Water-loss policy	AZ, CA, CT, FL, GA, HI, IN, IA, KS, KY, LA, MD, MA, MN, MD, NV, NH, NY, NC, OH, OR, PA, RI, SC, TN, TX, UT, VT, VA, WA, WV, WI, WY, DRBC, SWFWMD, SJRWMD	33	3	36
Definition of water loss	AZ, CA, GA, HI, KS, MD, MA, MN, MO, OR, PA, RI, SC, TX, WI, DRBC, SJRWMD	15	2	17
Accounting and reporting	AZ, CA, GA, HI, IA, KS, KY, MD, MA, MN, MO, NY, OH, OR, PA, RI, TX, WV, WI, WY, SWFWMD, SJRWMD	20	2	22
Standards and benchmarks	AZ, CA, GA, HI, IN, KS, KY, LA, MD, MA, MN, MO, NC, OH, OR, PA, RI, SC, TX, UT, WA, WV, WI, DRBC, SWFWMD, SJRWMD	23	3	26
Goals and targets	AZ, CA, FL, GA, HI, KS, KY, ME, MD, MN, MO, NM, OH, OR, PA, RI, TX, WI, SWFWMD, SJRWMD	18	2	20
Planning requirements	AZ, CA, CT, FL, GA, HI, IA, KS, MD, MA, MN, MO, NV, NH, OR, PA, RI, SC, TX, VT, VA, WA, WV, WI, SWFWMD, SJRWMD, DRBC	24	3	27
Compilation and publication	AZ, CA, HI, KS, KY, MN, PA, RI, WI, SWFWMD	9	1	10
Technical assistance	AK, CA, FL, GA, HI, KS, KY, ME, NV, ND, OR, PA, RI, SC, TN, TX, VT, WI, SWFWMD	18	1	19
Performance incentives	CA, GA, HI, IN, IA, LA, MN, NC, RI, TX, VT, SJRWMD	11	1	12
Auditing and enforcement	AZ, GA, HI, KS, MD, MN, NH, OH, OR, PA, SC, TX, WI, SWFWMD, SJRWMD	13	2	15

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CRMA (2nd) – ATTACHMENT 18

STATE OF TENNESSEE.

CHARTER OF INCORPORATION.

Be it known, THAT J. W. Howard, Z. W. Wheeland, P. H. Caldwell, C. D. Mitchell, and W. T. Tyler, are hereby constituted a body politic and corporate by the name and style of.

CHATTANOOGA MANUFACTURES' HOME COMPANY

for the purpose of carrying on and supporting a board of trade in connection with the manufacturing business of Chattanooga and vicinity, and said corporation having for its object to secure by a membership, representing as many as possible of the manufacturing industries in Chattanooga and vicinity, the welfare and best development of its manufacturing interests, by promoting better acquaintance among members and developing a social and mutual interest which will advance and extend the business of its various manufactures, said objects to be promoted, if desired, by serving refreshments to members and their invited guests, as well as by other methods.

#1. Said Corporation is also empowered and authorized, as provided by the acts of 1907, Chapter 82, to borrow money to be used in payment of property bought by it and erecting buildings, making improvements and for other purposes germane to the objects of its creation, and to secure the repayment of the money thus borrowed by mortgage, pledge or Deed of Trust upon such property real, personal or mixed, as may be owned by it and it may in like manner secure by mortgage, pledge or Deed of Trust, any existing indebtedness which it may have lawfully contracted.

The general powers of said corporation shall be, to sue and be sued by the corporate name, to have and use a common seal, which it may alter at pleasure; if no common seal, then the signature on the name of the corporation by any duly authorized officer shall be legal and binding; to purchase and hold or receive by gift, bequest or devise, in addition to the personal property owned by said corporation, real estate necessary for the transaction of the corporate business, and also to purchase or accept any real estate in payment or in part payment of any debt due to the corporation, and sell the same; to establish by-laws, and make all rules and regulations not inconsistent with the laws and Constitution deemed expedient for the management of corporate affairs, and to appoint such subordinate officers and agents in addition to a President and Secretary or Treasurer, as the business of the corporation may require, designate the name of the office and fix the compensation of the officer.

The said five or more incorporators shall, within a convenient time after the registration of this charter in the office of the Secretary of State, elect from their number a President, Secretary and Treasurer, or the last two offices may be combined into one; said officers and the other incorporators to constitute the first Board of Directors. In all elections each member shall have one vote, either in person or by proxy, and the result to be determined by a majority of the votes cast. Notice of any election must be given by advertisement in a newspaper, personal notice to the members, or a day stated on the minutes of the Board six months preceding the election. The Board of Directors shall keep a record of all their proceedings, which shall be at all times subject to the inspection of any member. The corporation may establish branches in any other county in the State.

The Board of Directors may have the power to increase the number of Directors from seven to ten, if they deem the interest of the corporation requires such increase. And the first or any subsequent Board of Directors may have the power to elect other members, who, on acceptance of membership, shall become incorporators equally with the original incorporators. The Board of Directors shall have the right to determine what amount of money paid into the treasury shall be a prerequisite for membership, or, if necessary, what amount shall be thus annually paid, and failure thus to pay shall, in the discretion of the Directors, justify the expulsion of said defaulting member. The term of all officers may be fixed by the by-laws, the said term not, however, to exceed three years. All officers hold over until their successors are duly elected and qualified.

The general welfare of society, not individual profit, is the object for which this charter is granted, and hence the members are not stockholders in the legal sense of the term, and no dividends or profits shall be divided among the members. The members may at any time voluntarily dissolve the corporation by a conveyance of its assets and property to any other corporation holding a charter from the State for the purposes not of individual profit, first providing for corporate debts.

A violation of any of the provisions of this charter shall subject the corporation to dissolution at the instance of the State.

This charter is subject to modification or amendment; and in case said modification or amendment is not accepted, corporate business is to cease, and the assets and property, after payment of debts, are to be conveyed, as aforesaid, to some other corporation holding a charter for purposes not connected with individual profit. Acquiescence in any modification thus declared shall be determined in a meeting specially called for that purpose, and only those voting in favor of the modification shall thereafter compose the corporation.

The means, assets, income or other property of the corporation shall not be employed directly or indirectly for any other purpose whatever than to accomplish the legitimate objects of its creation, and by implication shall possess the power to issue notes or currency, deal in currency, notes or coin, buy or sell products, or engage in any kind of trading operation, nor hold any more real estate than is necessary for legitimate purposes.

Expulsion shall be the only remedy for the nonpayment of dues by the members, and there shall be no individual liability against the members for corporate debts, but the entire corporate property shall be liable for the claims of creditors.

We, the undersigned, apply to the State of Tennessee, by virtue of the laws of the land, for a Charter of Incorporation for the purposes and with the powers, etc., declared in the foregoing instrument.

This 3rd day of August 1909.

Chas. W. Howard.

Z. W. Wheeland.

P. H. Caldwell.

C. D. Mitchell.

W. T. Tyler.

STATE OF TENNESSEE, COUNTY OF HAMILTON. Personally appeared before me, W. P. Hays, Clerk of the County Court of the County and State aforesaid, W. T. Tyler, one of the within named incorporators, with whom I am personally acquainted, and who acknowledged that he executed the within instrument for the purposes therein contained. Witness my hand, at office, this 4 day of August, 1909.

W. P. Hays, Clerk.

By-P. J. Heligan, Dep. Clerk.

STATE OF TENNESSEE, COUNTY OF HAMILTON. Before me, W. P. Hays, Clerk of the County Court of the County and State aforesaid, Personally appeared W. T. Tyler, subscribing witness to the within application for charter, who being first duly sworn, deposed and said, That he is acquainted with C. W. Howard, Z. W. Wheeland, P. H. Caldwell, and C. D. Mitchell, the incorporators therein named and that they acknowledged the same in his presence, to be their act and deed upon the day it bears date. Witness my hand and official seal, at office, this 4 day of August, 1909.

W. P. Hays, Clerk.

By-P. J. Heligan, Dep. Clerk.

STATE OF TENNESSEE, HAMILTON COUNTY. The above Charter and certificate were filed Aug 4, 1909, at 11:50 A. M. Entered in Note Book No. 13, page 72, and recorded in Book Y, Volume 9, page 75 at 629. Witness my hand at office in Chattanooga, Tenn.

A. C. Carroll, Register.

Thos Byrne, Dep. Reg.

This 5th day of August 1909

AMENDMENT TO CHARTER OF INCORPORATION

At a meeting of the Board of Governors of Chattanooga Manufacturers Home Company, a corporation duly organized and existing under and by virtue of the laws of the State of Tennessee relating to corporations organized for the general welfare of society and not for individual profit, which meeting was duly called and held in the City of Chattanooga, County of Hamilton, State of Tennessee, on the 14th day of September, 1966, the following resolution was duly adopted, setting forth a proposed amendment to the charter of incorporation of said corporation, declaring its advisability, and referring a decision thereon to a vote of all of the members of said general welfare corporation, said resolution being as follows:

RESOLVED, that the Charter of Incorporation of Chattanooga Manufacturers Home Company shall be amended by changing the name of said corporation to be

CHATTANOOGA MANUFACTURERS ASSOCIATION

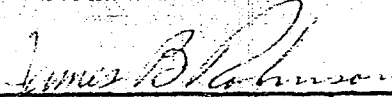
FURTHER RESOLVED, that the Board of Governors of the said general welfare corporation declares the advisability of the above proposed amendment to the Charter of Incorporation, and refers the same to the members of the said general welfare corporation entitled to vote for the consideration thereof, for the purpose of considering and voting upon the adoption thereof, said vote to be evidenced by written ratification of the action of the Board of Governors in so changing the name of said general welfare corporation to Chattanooga Manufacturers Association.

Pursuant to and in conformity with referral of said proposed amendment to the members of the said general welfare corporation, all of the members of said general welfare corporation voted in favor of said amendment. Thereupon the Board of Governors of said general welfare corporation has authorized the President and

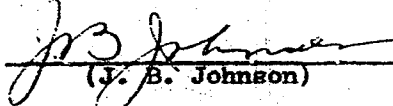
Secretary of the corporation to execute this certificate accordingly.

NOW, THEREFORE, WE HEREBY CERTIFY to the foregoing to the end that this certificate may be duly filed and recorded in the office of the Secretary of State of the State of Tennessee and in the office of the County Register of Hamilton County, Tennessee, within which county the corporation has its principal office; and on behalf of said corporation do hereby apply to the State of Tennessee for an amendment to the charter of said corporation for the purposes therein shown.

WITNESS our hands this 14th day of September, 1966.


(James B. Robinson)

President



(J. B. Johnson)

Secretary

STATE OF TENNESSEE)
COUNTY OF HAMILTON)

Personally appeared before me, a Notary Public in and for the State and County aforesaid, JAMES B. ROBINSON and J. B. JOHNSON, with whom I am personally acquainted, and who made oath before me in due form of law that James B. Robinson is the President and J. B. Johnson is the Secretary of Chattanooga Manufacturers Home Company, and that the statements contained in the foregoing certificate are true.

In Witness Whereof, I have hereunto set my hand and seal of office in Hamilton County, Tennessee, this 14th day of September, 1966.


Notary Public

My commission expires My Commission Expires Oct. 9, 1967

BY LAWS

CHATTANOOGA MANUFACTURERS ASSOCIATION

ARTICLE I **OBJECTIVES**

The objectives and purpose of this corporation shall be to promote the manufacturing interests of Chattanooga and vicinity by all legitimate means; to aid in securing new industries in Chattanooga territory; to promote wise and beneficial legislation and to oppose that which is unfair to industry.

This Corporation shall not engage in any business activity for profit.

ARTICLE II **MEMBERSHIP**

Section 1. REGULAR MEMBERS

Any company that operates a manufacturing or processing facility in Hamilton County and having an interest in promoting industrial development in the area, is eligible for regular membership.

Section 2. ASSOCIATE MEMBERS

Any company that is engaged in manufacturing or processing outside of Hamilton County or any company that is not engaged in manufacturing or processing but has an interest in promoting manufacturing in the Chattanooga area is eligible for associate membership.

Section 3. HONORARY MEMBERS

The Board of Directors may, by unanimous vote, elect to honorary membership any person who, by reason of eminence in industrial lines or conspicuous service, may be deemed to be worthy of such distinction.

ARTICLE III **ELECTION TO MEMBERSHIP**

Membership in the Association shall be by invitation from the Board of Directors, seven affirmative votes of the Board being required. Any company or corporation so invited shall file application for membership in writing, accompanied by a check for an amount to be determined by the dues schedule in effect at the time. Upon payment of dues, the applicant shall be deemed elected to membership.

ARTICLE IV
ANNUAL MEETINGS OF THE CORPORATION

The regular meeting of the Corporation shall be held in October or November at such time as the Board of Directors may designate. Special meetings of the Corporation shall be held when directed by the Board of Directors. Notices in writing shall be sent to all members within a reasonable time prior to such meetings.

At any regular or special meetings, twenty-five members, one from each member firm shall constitute a quorum.

ARTICLE V
BOARD OF DIRECTORS

Section 1. BOARD OF DIRECTORS

The Board of Directors shall consist of twelve elected members, all from the regular membership, who shall perform the duties usually pertaining to their office. The elected directors shall each serve for a term of three years, with four to go off and four to be elected each year. In addition to the twelve elected Directors, the retiring Chairman of the Board, each year, shall remain on the Board for two years from the date of retirement as past Chairman of the Board, and shall have the same authority as the members of the Board. Directors serving as Officers shall continue to serve as Directors during their terms as Officers. There shall be two past Chairmen of the Board on the Board of Directors at all times. Chairmen of CMA committees will serve as ex-officio members of the Board of Directors.

Section 2. NOMINATIONS

- (a) At the regular meeting of the Board in August each year, the Chairman of the Board shall appoint a Nominating Committee, two of whom shall be members of the Board of Directors. Said committee shall nominate candidates for vacancies on the Board of Directors, caused by the retirement of members whose term shall expire. The nominating committee shall furnish not later than September 25th, the names of candidates to the Secretary/Treasurer. The election shall be held at the Annual Meeting of the Corporation.
- (b) Any seven members may submit an independent ticket consisting of one nominee for each vacancy to be voted on at the annual election provided herein. Such independent ticket shall be filed with the Secretary/Treasurer within five days after the announcement of the other nominations herein provided for. The names of those thus nominated shall be placed on the ticket with the nominees of the nominating committee.
- (c) All nominations shall be posted at the corporation office by the Secretary/Treasurer within five days after they are received by him.
- (d) In the event there are two tickets nominated, typewritten or printed ballots shall be prepared containing the names of the nominees listed in alphabetical order.
- (e) One representative from each regular membership firm present, or represented by proxy at the Annual Meeting shall be entitled to cast one vote for each of the board vacancies by placing a cross mark after each name he wishes to vote for. The ballot shall be cast in the usual way, and the candidates receiving the greatest number of votes shall be declared elected.

Section 3. BOARD VACANCIES AND HOW FILLED

- (a) If the occasion should arise whereby there are less than two past Chairmen of the Board on the Board, the Chairman of the Board shall appoint one or more most recent available past Chairmen to serve as members of the Board for one year, or until the situation corrects itself.
- (b) If during the year, a vacancy shall occur on the elected Board of Directors by reason of death, resignation or otherwise, the Board of Directors shall elect a director to fill the unexpired term.

Section 4. BOARD MEETINGS

- (a) The Board of Directors shall meet on a frequency determined by the Board of Directors at such times and places as may be designated. Special meetings of the Board of Directors may be called by the Chairman of the Board, or by two or more members of the Board by giving at least three days notice in writing.
- (b) Seven members of the Board shall constitute a quorum. The Chairman of the Board of the corporation is a Director, but shall vote only in the event of a tie vote.
- (c) If a member of the Board shall be absent from three successive meetings, unless excused by the Board, the Board can consider his place vacant and elect a successor for the unexpired term.

ARTICLE VI

OFFICERS/DUTIES OF OFFICERS

Section 1. OFFICERS

The Board of Directors shall, at a regular or called meeting of the Board in October of each odd-numbered year, elect a Chairman of the Board, a Vice-Chairman, and a Secretary/Treasurer, all to serve without compensation. Any two or more offices may be held by the same person except that of President and Secretary/Treasurer. Officers shall be elected by the Board of Directors from among their membership. Such officers shall hold their offices for a two years or until their successors have been elected. Offices of the President and Assistant to the President, shall be subject to such terms as the Board may at its discretion determine.

Section 2. DUTIES OF OFFICERS

- (a) The officers of the Corporation shall fulfill the duties usually appertaining to their respective offices.
- (b) Chairman of the Board; The Chairman of the Board shall preside as Chairman of all meetings of the Corporation and the Board of Directors. The Chairman shall, with approval of the Board of Directors, appoint such committees as may be authorized by these By-Laws or by the Board of Directors.
- (c) Vice-Chairman; The Vice-Chairman of the Board shall serve in the absence of the Chairman.
- (d) President; The President shall be the chief executive officer of the Corporation. All activities of the Corporation shall be conducted under direction of the President in accordance with the policies adopted by the Board of Directors.
- (e) Secretary/Treasurer; The Secretary/Treasurer shall have custody of all moneys of the Corporation. All checks shall be signed by any two of the four elected officers who

shall be designated by the Board to sign checks. The Secretary/Treasurer shall make a report to the Board of Directors monthly. The Secretary/ Treasurer shall have charge of all the books and papers of record belonging to the Corporation, and shall keep the board of Directors advised through the Chairman of the Board, of all unpaid fees or dues. All employees of the Corporation shall report to and be subject to the authority of the Secretary/Treasurer, except as otherwise directed to report by the Board of Directors.

- (f) The Executive Assistant to the President shall actively recruit new members, manage the business affairs of the Corporation office and facilitate communications between the office and the provider of accounting services, and shall serve in the absence or disability of the Secretary/Treasurer. The Executive Assistant to the President shall keep a record of all meetings of the Corporation, shall furnish to any committee desiring it, such aid in their work as may come within the scope of the office, and shall notify new members of their election.

ARTICLE VII FISCAL YEAR

Section 1. FISCAL YEAR

The fiscal year of the corporation shall be from October 1 to September 30, inclusive.

Section 2. BUDGET

A budget of revenue and expense shall be prepared by the President's office for presentation in September each year for the succeeding fiscal year of the Corporation. The budget is to be referred to a budget committee consisting of the Chairman, Vice-Chairman and the Secretary/Treasurer, who shall make plans to provide revenue based upon the budget, and submit their report and recommendations to the Board of Directors.

Section 3. PAYMENT OF EXPENSE

All bills against the Corporation, before being paid must be approved by the President if authorized directly by the Board of Directors or by the Chairman of the respective Committees in whose departments they may come, if authorized in the budget. No committee shall expend or contract to expend more than the sum provided for it in the budget without previous action by the Board of Directors.

Section 4. SALARIES

The Board of Directors shall fix the salary of the President and Executive Assistant to the President.

Section 5. DUES SCHEDULE

The Board of Directors shall annually establish a schedule of dues that they deem necessary to meet the expense of the Corporation for the succeeding year; provided, however, that any member may have a hearing before the Board of Directors for the purpose of showing any error, if such member believes it is not equitably assessed.

Annual assessments shall be payable within thirty days after notification by the Secretary/Treasurer to the member of the amount of the assessment, but in lieu of cash, payments may be paid quarterly in advance when requested by a member.

Section 6. APPROPRIATION OF FUNDS

The funds of the corporation shall not be expended for other purpose than carrying on its work and the accomplishment of the objectives set forth in its charter.

ARTICLE VIII COMMITTEES

The Chairman of the Board, with approval of the Board of Directors, shall appoint at the first meeting after the Annual Meeting, such committees from the membership of the Corporation as may be deemed necessary to carry out the views, resolutions or instructions of the Corporation.

ARTICLE IX AMENDMENTS

These By-Laws may be amended either at any Annual Meeting of the Corporation, without notice, or at any regular or special meeting provided the Board of Directors shall have caused ten days notice of such intention, to be mailed to each member of the Corporation, notifying them of the changes contemplated, or may be amended by the Board of Directors at any of its meetings, two thirds of the whole Board concurring.

ARTICLE X EMPLOYEE REVIEWS

Annually, during September, the Chairman and the immediate Past Chairman shall meet individually with the employees of CMA to review their performance.

SUMMARY OF 8/19/98 REVISIONS

- Article I, Sections 2&3; Combined "Sustaining" and "Associate" members
- Article III, and Article VII, Section 5; Added references to "dues schedule"
- Article V, Section 1; Added provision for Officers to continue as Directors during their terms as officers
- Article VI, Sections 1&2; Combined Offices of "Secretary" and "Treasurer"; Eliminated title of "Assistant Secretary"; Replaced with "Director of Development"

SUMMARY OF 10/19/00 & 11/15/00 REVISIONS

- ◆ Article III; change “five” to “seven” affirmative votes required for membership
- ◆ Article V, Section 1; change Board of directors from “nine” to “twelve”; change number of Board members elected and going off each year from “three” to “four”
- ◆ Article V, Section 2c; remove mail notification to membership of board nominees
- ◆ Article V, Section 4a; remove requirement for monthly board meetings
- ◆ Article V, Section 4b; change quorum requirement from “Five” to “Seven”
- ◆ Article V, Section 4c; remove “by reason of sickness or absence from the city”
- ◆ Article VI, Section 1; change to “a” Vice “Chairman”

SUMMARY OF 10/22/03 REVISIONS

- Article II, Section 3; Remove Individual Membership
- Article VI, Section 1; Article VII, Section 2F, and Article VII, Section 4; Change “Director of Development” to “Assistant to the President”.

SUMMARY OF 4/25/07 REVISIONS

- Article IV, add “or November”
- Article VI, Section 1, change terms of Officers to “two” years and add “Executive” to the title of “Assistant to the President” in this Section and others as appropriate.

4/25/07